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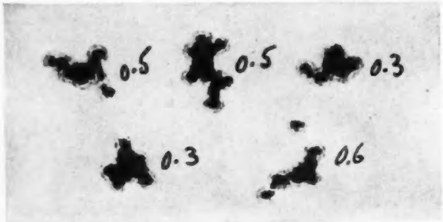

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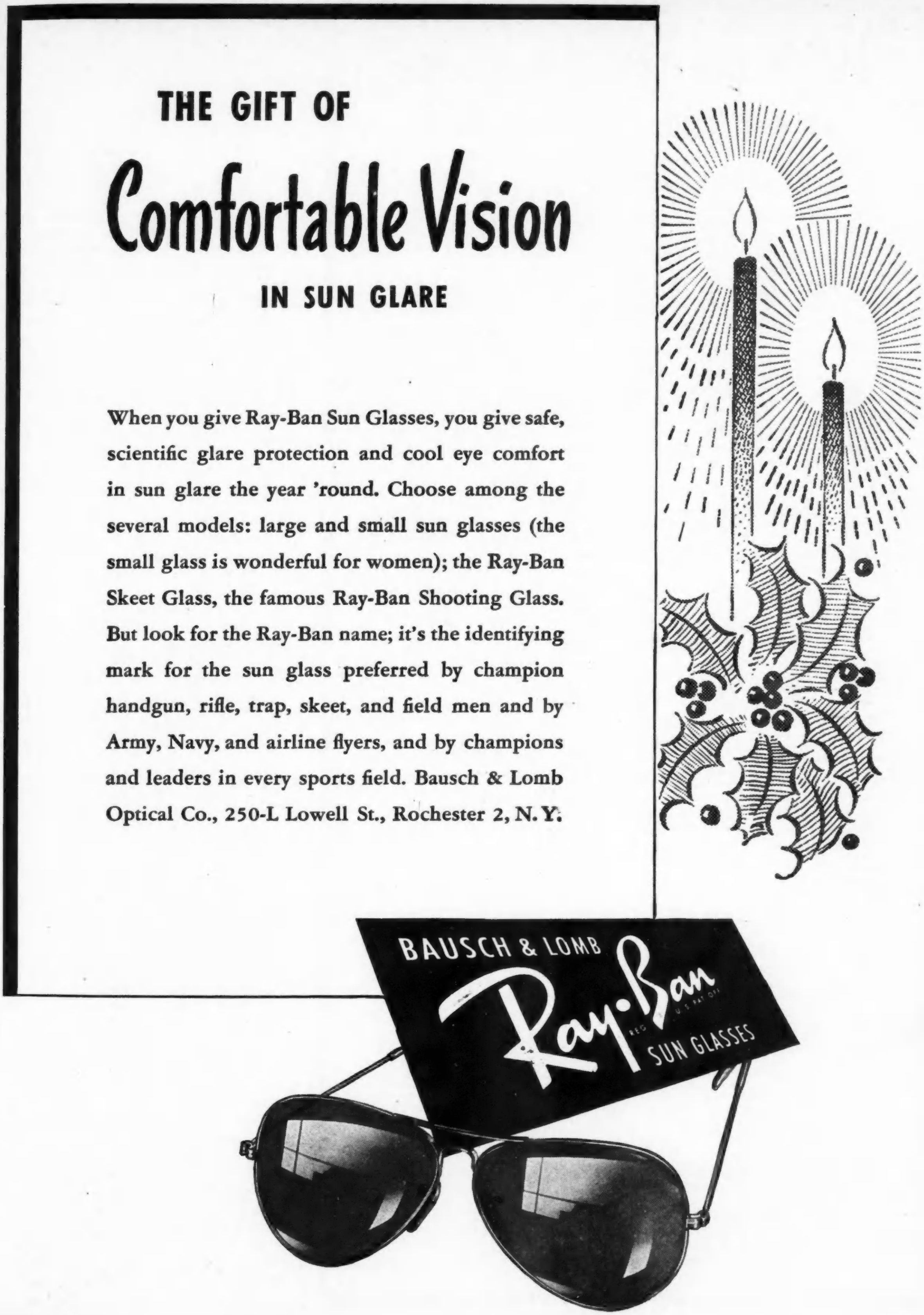

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RIFLEMAN WORDS . . . .

Each month this "lexicon for shooters" is devoted to a few words peculiar to the shooting game which may be puzzling to the newcomer. All words defined are used in a current article.

CHOKE BORE—A slight constriction inside the muzzle of shotgun barrels, which tends to keep the shot together, rather than allowing it to scatter over a wider area. The most commonly used degrees of choke are "full" and "modified." Shotgun barrels without choke boring are called "cylinder" bores.

WADS—Discs of paper, cardboard, felt, etc., which are placed over the powder and shot charges in a shotgun shell. The wads which are placed between the powder and shot are usually of a thick compressible substance, while the over-shot or top wad is of thin cardboard. Recently, ammunition manufacturers have developed shells without top wads, or with wads which break at the instant of firing. These developments prevent "blown patterns," which occur when the top wad fails to drop as it leaves the muzzle and thus scatters the moving shot charge.

INLETTING—Removing the wood from the inner surfaces of a gunstock in order to fit it to the metal parts of a rifle. Poor inletting is one cause of inaccuracy. See BEDDING.

BOX MAGAZINE—A type of magazine loading in which cartridges are fed into the chamber of a rifle from a box-like metal container beneath the bolt.

MAGAZINE BOX—In a bolt-action rifle, the metal parts which lie within the stock around the magazine, from which cartridges are fed into the chamber.

MICROMETER SIGHT—A rear sight for rifles, having exact adjustments for windage and elevation, regulated by knobs or dials.

RECOIL LUG—The portion of a rifle which supports the metal parts in the stock against the action of recoil.

DRY SHOOTING—Practicing with an unloaded rifle or handgun. "Snapping in," as it is sometimes called, is one way of learning the fundamentals of trigger squeeze and aiming.

PROGRESSIVE POWDER—A type of gunpowder which starts burning slowly when ignited by the primer, and gains in speed of burning as pressure is built up inside the cartridge or shotgun shell. This term is used to distinguish these forms of smokeless powder from older propellants which burn at much the same speed regardless of the amount of pressure built up within the cartidge.

BOLT STOP—In many bolt-action rifles, the part which prevents the bolt from being withdrawn entirely from the action.

BULL GUN—A rifle with heavy barrel and accurately adjustable sights, especially designed for long-range target shooting.

CRIMP—Turning in the mouth of a shotgun shell or cartridge case to hold the top wad or bullet in place.

BEDDING—The cuts in a gunstock into which the metal parts of a rifle are seated.

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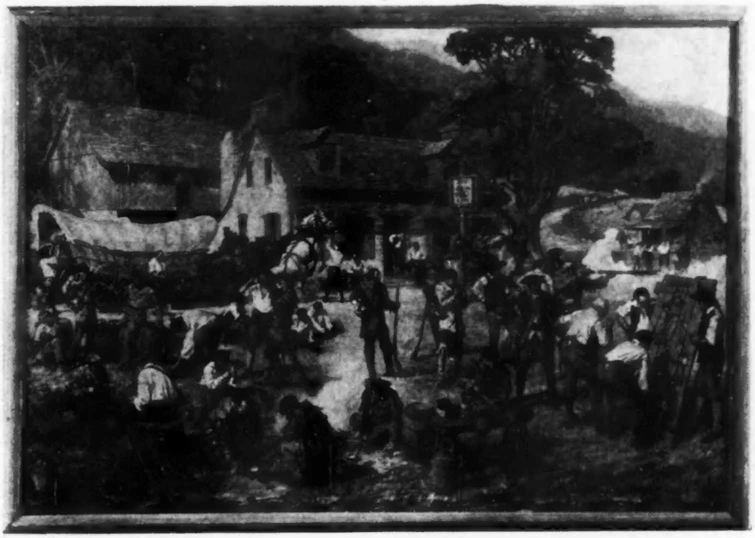

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A new, full color historical print, suitable for framing, reproduced from Gayle Hoskins' vivid painting, that every sportsman will want for den, gun room, or rumpus room.

The scene shows Captain Nagle's Company of Pennsylvania Riflemen holding a shooting match at some country crossroads tavern in Berks County, early in the year 1775.

Only a month or so later than this painting depicts, "Nagle's Dutchmen," as they were generally called, were on the march to Cambridge to join up with General Washington's army. There, they made history and established rifle scores of a sort which every American is intensely proud.

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ABOUT THE ARTIST: Gayle Hoskins, the famous Wilmington, Delaware artist, was one of the outstanding students of the late, great Howard Pyle. Mr. Hoskins has shown especial aptitude for historical scenes and outdoor subjects involving firearms; and to our critical demands for accurate weapons and period correctness he has given a most satisfying degree of interest and study.

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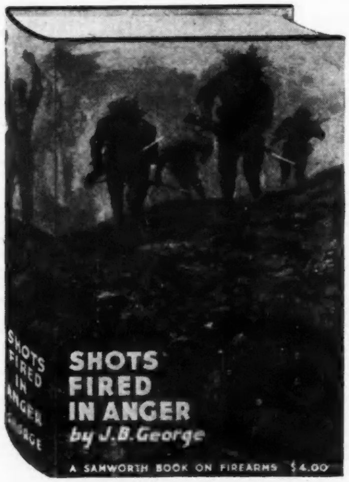
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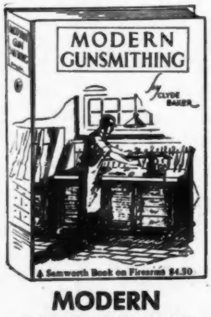
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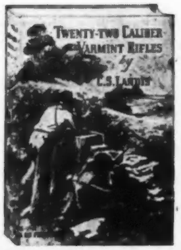
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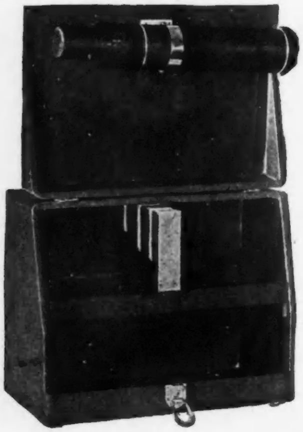

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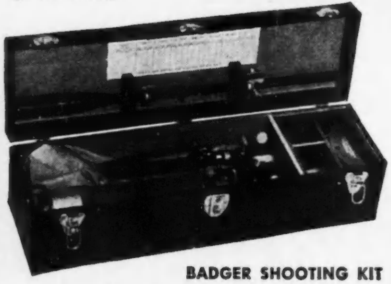

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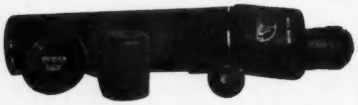

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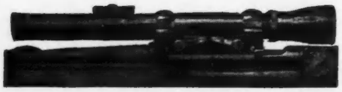

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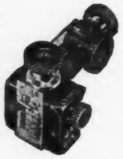

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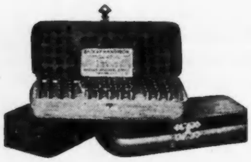

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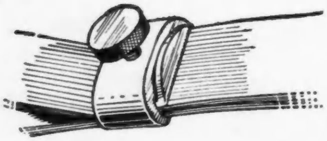

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The SPOTTING SCOPE
With RAY STANN

The Florida Grapefruit Circuit is now definite! The National Midwinter Smallbore Matches will be revived at St. Petersburg March 3-7; followed by the second postwar Midwinter Pistol affair at Tampa March 9-13 . . . Sponsors of New York City's abortive attempt at a drastic raise in pistol permit fees have asked the Greater New York Pistol League to call off protesting mail, telephone, and wire communications. The measure, asking for a hike from $1.50 to $10.00 in the yearly rate, has now been officially shelved . . . Nice going GNYPL. The shooting game lost when that fine Hearst newsman, Sam Kennedy of the Pittsburgh Sun-Telegraph, died of a lingering spine ailment at 68. No one will ever know the agony he went through or the pleasure he derived from that last trip to Perry in August to shoot that final match—NRA Life Members'.

☆ ☆ ☆

Conservationists say the entire wildlife resource of the West is under threat by HR 1330, carried over from the last Congress. The measure, actuated by a small group of Western stockmen, would sanction the grabbing off, in wholesale lots, the publicly-owned lands of the West (specifically: Jackson Hole Monument in Wyoming) for their own purposes, at the expense of watershed, timber, and wildlife values of interest to sportsmen. The Izaak Walton League and other conservation groups are urging U. S. sportsmen to get in the fight . . . To give time for U. S. Olympic Team tryouts, all 1948 regional matches must be concluded by July 4 . . . Smitty Brown, stricken by a cerebral hemorrhage last Spring is on the recovery road and looking to the Tampa matches . . . Lee Echols is working on plans for a big pistol shoot on the new Calexico Gun Club range at El Centro, Calif., March 6-8 in connection with the Desert Cavalcade Celebration.

☆ ☆ ☆

The Law & Guns: In Chicago, Seaman Frank Spizzaro was jailed on a disorderly conduct charge and missed his ship sailing when police picked him up on the complaint of a bus passenger that the butt of a gun was sticking out of his pocket. It was a cap pistol for his 14-year-old brother. In Washington, Metropolitan Police ballistics "expert" Inspector John Fowler testified in court while trying to prove that a BB gun is a dangerous weapon, that the pellet fired from a five-foot distance in tests had imbedded itself deeper in wood than those fired from shorter distances because it had a chance to gain velocity. What were they—jet-propelled?

☆ ☆ ☆

Ten-year-old Gary O'Connor, of Detroit, recently won the NRA's Distinguished Rifleman award, the youngest shooter to ever get to the top of junior honors . . . Much credit to Alfred Andriola who draws the *Kerry Drake* strip for his pre-hunting season gun safety cautions . . . Rhubarb of the season goes to the New York brewery which has littered subway cars with pictures of alleged target shooters guzzling beer on the range.

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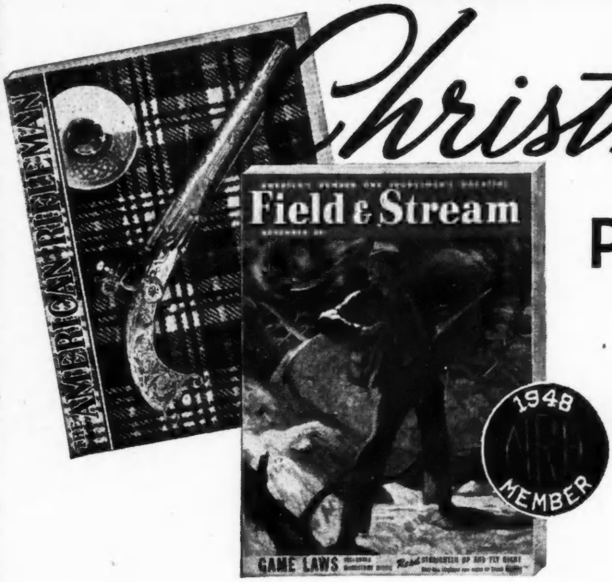

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Incidentally . . .

Every month, when the advance copies of THE RIFLEMAN come off the presses, the "editorial board" gets together for a bull session. It gives us a chance to chew over the previous issue in the light of reader reaction already received . . . to criticize the magazine just completed . . . and to plan ahead for the next issues. Each month, too, an "outsider" is asked to sit in . . . a staffman from competitions, technical, membership . . . just to remind us that the magazine must always function as an integral part of the NRA. Last month it was technical's Al Barr . . . who, among other observations, took us apart for leaving out a paragraph of one of his stories. There's always someone on hand and, whoever it happens to be, he serves as a reminder that the magazine goes out each month to a quarter-million subscribers . . . who are *also* National Rifle Association members. That word *also* is the important point.

* * *

In every meeting there's a lot of good loud squabbling . . . encouraged by Executive Director Lister himself. "As long as you guys argue," he tells us, "there's no chance of the magazine going stale." So the arguments span a whole morning, the air turns blue from the smoke of a half dozen pipes and cigarettes . . . and out of the session, always, come ideas, criticisms, layouts, subjects—the raw materials from which all magazines are built.

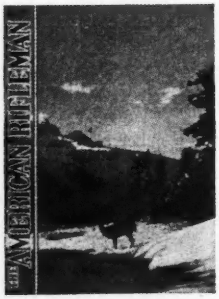
We work, in these editorial sessions, from a "control board"—a three-by-five-foot affair on which a whole year's issues are lined up. Articles are represented by colored tags. Gradually, as one issue after another takes shape and is consigned to the printer, the green "idea" tags are replaced by the bright yellow of articles on file. And gradually, too, the yellow tags change. A red mark is added when art work is completed, and a bright red crossmark when the material is put into page form. Finally, once a month, an issue is taken from the board, the marked-up tags are thrown away, and the space is cleared for preliminary planning of another issue a full year ahead.

* * *

Looking over that board of ours, we can already get a good idea of what's ahead for 1948. It will be the same old RIFLEMAN, of course, but with some new slants and, we think, some editorial scoops that will create a lot of interest. New products, for instance . . . things that we can't even mention as yet . . . but you'll see the news of them first in the RIFLEMAN. And there are some technical articles coming that we're mighty proud of. Optical coating, for instance, by the man who invented the process . . . binoculars by two of the best-qualified people in the country . . . attachments for scope sights . . . to mention only the subject of shooter's optics. And, incidentally, that three-part article on binoculars, we think sets a new high for clear, concise presentation of a technical subject. These are the sort of articles that lead readers to keep RIFLEMAN back issues in a permanent file . . . good substantial reference material.

In every other category, we've planned a lot of fine material . . . a series on indoor rifle shooting by a well-known collegiate coach . . . dope for the reloader on the newest of wartime light-metal alloys, to follow Hutton's and Barr's sensational velocity experiments with Kirksite . . . more on the most famous old-timer riflemakers . . . a series on arms and ammunition manufacture, with pictures taken in our great firearms plants . . . and there'll be other surveys of the shooting game like Rose's deer-kill questionnaire, which concludes in this issue. All-in-all, 1948 should be a year that RIFLEMAN readers will remember.

To wrap up our 1948 package, our covers . . . a dozen fine four-color reproductions. Watch particularly next spring and early fall. We've got some for those seasons that we think will stack up favorably against those on any magazine in the country.—J. S.



COVER

Soon, when the first snows of winter begin to deepen, this young fellow will be heading for low country. Pictured in the high mountains of Garibaldi Park in British Columbia, this deer is the fourth in the series of North American big game to be the subject of Rifleman covers. Ray Atkeson of Portland, Oregon, made the photograph.

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The AMERICAN RIFLEMAN

Official Journal of the National Rifle Association of America
1600 RHODE ISLAND AVENUE, N.W., WASHINGTON 6, D. C.

VOLUME 95 NUMBER 12

DECEMBER 1947

Chasing Rainbows 9
BY AL BARR

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Christmas Challenge

THERE is every indication that more guns will be given as Christmas presents this year than ever before. They will cover the field from high-powered big-game rifles to small-bore rifles, .410 shotguns, and rubber-tipped dart guns. Most of them will be given to youngsters, some will go to older folks recently interested in the recreational possibilities of firearms. It is one of the oddities of our time that a great many people who are opposed to universal military training are, nonetheless, concerned about our national defense. While questioning the value of the kind of military training that might be given under the direction of the "army mind," these people believe that physical fitness, mental preparedness, and a knowledge of safe, efficient gun handling are essential, common-sense forms of preparedness which should be encouraged by patriotic Americans. There is small evidence this Christmas of the antigun, antitoy soldier psychology which was so prominent in the decade following World War I.

As a result, the American shooter is faced with a tremendous opportunity and confronted with an enormous risk. There have never before been so many Americans willing to be shown that guns are constructive tools which may be used to build healthy minds and bodies, to cement father and son relationships, to develop self-discipline, initiative, team spirit, to mold better citizens. Here, then, lies our opportunity.

Each sportsman's club—rifle, pistol, trap, skeet, conservation—should undertake a definite instruction program starting the week after Christmas to teach gun safety and the constructive phases of gun handling to the youngsters and oldsters who found a gun in their Christmas stocking. Shotgun, rifle, pistol, air gun—what matters the type? The principles of safe gun handling, of good sportsmanship are the same for all. Placards in the windows of sporting goods stores, comment in the outdoors column of the local newspapers, a circular placed by the dealer in the wrappings of each gun sold for Christmas will bring many a tyro to the "gun school" with his Christmas gun. But the clubs cannot reach into the family circle on Christmas day. Here the burden lies directly on the individual sportsman. He may be father, brother, uncle, or friendly neighbor. The Christmas gun may be no more powerful than the "pistol" shooting a rubber-tipped dart, but whatever the weapon it will open the door to lessons in gun safety and good sportsmanship.

If we, as individuals and as organizations, fail to capitalize on these opportunities to do a constructive educational job with these Christmas guns, we must then accept the responsibility for the enormous risk that inevitably arises when tens of thousands of real and toy weapons are placed in the hands of tens of thousands of untrained boys and men. We know, better than anyone else, that guns are valuable, constructive tools in the hands of the properly trained and that they are dangerous, destructive weapons only in the hands of the untrained. Knowing this, we have no acceptable excuses if we fail to accept the challenge posed for us by the gift guns which will be under so many trees this Christmas. Few of these guns will fall into hands which could not be properly trained if *some* shooter would but take the little bit of time and show the little bit of interest that would be necessary to do the job. In your neighborhood, mister, that "some shooter" means *you!*—C. B. L.

WHICH CARTRIDGE IS THE MOST ACCURATE? . . . HERE IS A SIGNIFICANT ANSWER FROM AL BARR:

CHASING RAINBOWS!

Ever since the 15th century, when an unknown German craftsman first put grooves in a gun barrel, riflemen have been attempting to put all of their bullets into one hole. The groups on this and the following pages (reproduced exact size) are a fair sample of how successful the shooters of yesterday and today have been in reaching that will-o'-the-wisp goal. As far as we know, these represent the finest accuracy of which the rifle is now capable.

In point of time, these fifteen groups span a period from the Civil War to the present day. The rifles with which they were made vary from the fine cap-and-ball weapons of nearly a century ago to the high-velocity, small-bore arms of today's experimenters.

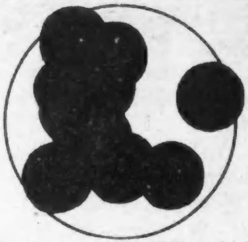
Looking at these targets raises some questions which have never satisfactorily been answered. Which of our cartridges is inherently the most accurate? Can the records set years ago by such great riflemen as Pope, Kelly, Niedner, and Rowland be equalled today?

In November, 1921, Colonel Townsend Whelen fired seven consecutive shots at 600 yards for a group which measured less than two and one-quarter inches, center to center. The group was made with the standard .30-'06 cartridge, the 170-grain boattail bullet, and 49 grains of an experimental powder. A Mann V-rest was used.

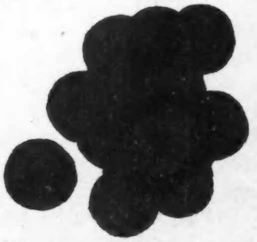
More familiar to the shooters of today are the unsurpassed records of the late Charles W. Rowland. His most famous ten-shot 200-yard group measures 13/16 of an inch, center to center. That same measurement holds true for a 200-yard ten-shot group fired by the dean of American riflemakers, Harry Pope.

Both of these groups were fired with Pope muzzle-breech loading rifles. That system of loading, in which a cast bullet was inserted at the muzzle and the powder charge inserted from the breech, was considered by Pope to be the best way to obtain fine accuracy with the arms and components then available. Over a period of years that combination produced as many exceptionally small groups as we have record of with any one type of cartridge. Certainly more care and skill was lavished on the shooting of these muzzle-breech loading rifles

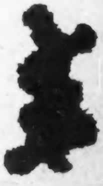
(Continued on next page)



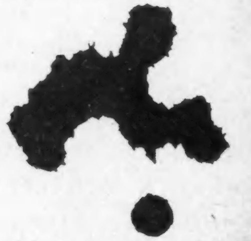
Ten shots at 40 rods (220 yards), fired in 1859 by Morgan James, with a rifle of his own make



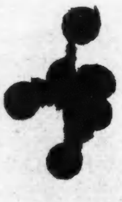
Ten shots at 200 yards, bench rest, with Niedner percussion rifle. Group was made in 1939



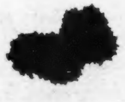
Ten shots at 200, with Pope .33-40 rifle. Group was made by Pope about forty years ago



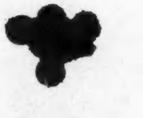
One of C. W. Rowland's 200 yard groups, made with Pope .32-40. Rifle was fired in machine rest



Ten shots, 100 yards, by H. A. Donaldson with Pope .32-40. Group includes 3 "warm-up" shots

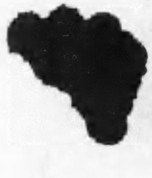


H. A. Donaldson: 5 shots at 100 yards, with a .32-40 Pope rifle and bench rest. Date: 1936



Another fine Donaldson 5-shot 100-yard group, using .32-40 Schoyen-Ballard on bench rest

Five shots, 100 yards, fired by H. A. Donaldson in 1931. Rifle was the same .32-40 Schoyen



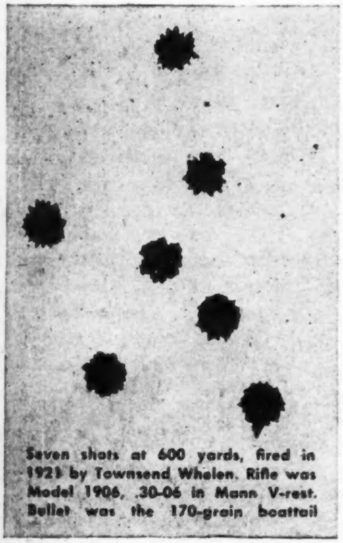
Another of Rowland's machine rest groups at 200 yards. It probably was made with same rifle as group shown above

than has been true with any other combination of which we know.

In modern times a few riflemen have produced outstanding groups with the fine rifles made years ago by Harry Pope, Schoyen, and Zischang. Outstanding among these shooters is H. A. Donaldson. Four of his fine 100-yard groups are reproduced.

When discussing small groups, it would be unfair to pass over the records set by the muzzleloading percussion rifle. While it did not use a cartridge, it produced some exceptional groups, even with black powder. N. H. Roberts, in his book *The Muzzle Loading Cap Lock Rifle,* reproduces a 200-yard bench-rest group of one and one-quarter inch, center to center, for ten shots. The group was made in 1939 by Adolph Niedner, using a rifle of his own make. Roberts also illustrates a forty-rod (220-yard) group fired many years ago with a Morgan James rifle. This group measures 13/16 inch, center to center, for the ten shots.

When considering those groups for comparative purposes, the best of them average approximately one-third minute of angle. The Whelen 600-yard group, to be exact, subtends .356 minute and both the Pope and Rowland groups go into .389 minute. It is difficult to imagine greater accuracy!

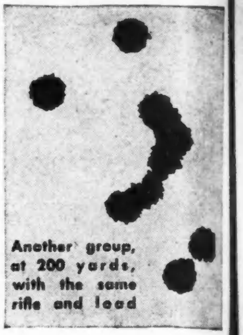


Seven shots at 600 yards, fired in 1921 by Townsend Whelen. Rifle was Model 1906, .30-06 in Mann V-rest. Bullet was the 170-grain boattail

Unfortunately, as fine as are all of these groups, they give us little help in arriving at an answer to our first question. Single groups prove nothing other than that everything happened to be working to perfection at the time the shooting was done. The Whelen group, for instance, represents the finest long-range accuracy of which we have record. But everyone should know that, as good as it is, the .30-'06 is by no means our most accurate cartridge. Nonetheless, we are forced to ask ourselves how many of our present-day cartridges and rifles will produce groups smaller than these old targets made by Pope, Neidner, Rowland, Whelan, Donaldson, and the others.

We have no record of recent ten-shot 200-yard groups which are as small as those we know the old timers made. There may be several reasons why such groups are not being produced today. Modern cartridges, for one thing, give much higher velocity than those in the .32-40 class, and as a result barrel life is much shorter. The accuracy life of a modern high-velocity barrel, as far as half-inch groups are concerned, is painfully short. Furthermore, with some exceptions, we must depend on commercially made bullets. The old bench-rest shooters made their own. That was only one of the various loading operations which were performed with extreme care in those days. Many times a single cartridge case was used for a test, loading it with a *weighed* bullets, *weighed* primer, and *weighed* powder charge after each shot. This is the type of precision shooting required to determine just how accurate a cartridge is.

Ten shots at 200 yards, bench rest, from Al Barr's .22-30 bull pup. Bullet used was 55-grain, with 24 grains 4198 powder



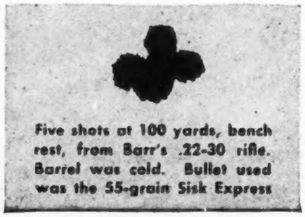
Another group, at 200 yards, with the same rifle and load

Perhaps the main reason why one cartridge may seem more accurate than others is that an extremely careful loader and experimenter has gone "all out" to see what that cartridge would really do. This sort of experimenting must be done by *many* shooters with *all* of our really good cartridges before we can even make a guess as to which is the most accurate.

A case in point is the .219 Donaldson Wasp, which has been explored by two shooters who are thoroughly familiar with the old timers' methods of reloading and shooting. Some consistently fine groups were reported with the .219 Wasp by Samuel Clark, Jr., in the February, 1947, issue of THE AMERICAN RIFLEMAN. The smallest 100-yard ten-shot group he mentions measured three-eighths inch. But one would have to read much further than that article to get the complete story of Clark's and Donaldson's fine results with this cartridge. A description of the procedure for selecting and making bullets appeared in the July, 1937, issue of THE RIFLEMAN. A follow-up on careful bench-rest shooting by the same author appeared in the October, 1947, issue.

In the accuracy experiments with the Wasp, no point in extreme care for assembling the ammunition was overlooked. The rifles were selected and chambered to specific, exacting requirements. The bullets were weighed and the loads assembled with loving care. Variations were held to the absolute minimum.

All of these items go into the production of extremely accurate loads, and we do not now have enough experimenters to do this type of work. That is, tireless, competent experimenters who will, for instance, use one cartridge case and reload it for each successive shot. This is the type of handloading which made the .32-40 and other cartridges famous. Until such comparative methods are used, we are going to remain in the dark as to which is our most accurate cartridge. When there are relatively few shooters as interested in one caliber as Clark and Donaldson have been in the .219, we will be a long time actually learning what the most accurate cartridge is.



Five shots at 100 yards, bench rest, from Barr's .22-30 rifle. Barrel was cold. Bullet used was the 55-grain Sisk Express

Just to verify what could be done with proven cartridges and normal com-

AL BARR'S article on accuracy comes as a logical conclusion to the RIFLEMAN'S *series on getting the most out of your rifle. Other in the series were:*

J. I. Davis, "This Business of Accuracy," January, 1947
"Reloading For Accuracy," March, 1947
Morgan Holmes, "Inletting for Accuracy," February, 1947
"Guinea Pig Varminter," March, 1947
Samuel Clark, ".219 Donaldson Wasp," February, 1947
"Varmint Bullets," July, 1947
Whelen et al, "Bench Rest Technique," October, November, 1947
Hankins, "The Man Behind the Gun," October, 1947

ponents, I spent one afternoon recently trying two of my own favorites. I have nothing to sell and I do not think these cartridges are really superior to many others which are available. Knowing, however, that I had two good rifles with tried-and-tested loads, an entire afternoon was spent in making two ten-shot 200-yard groups with each rifle. Selected loads and bullets were used in the test, and the rifles were fired from a bench rest.

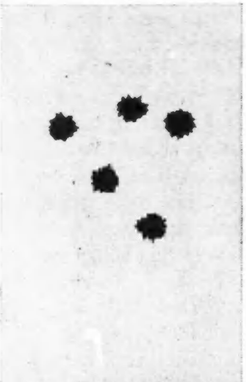
Using the .22-30 or shortened .220 Swift case (my own design) and 24.0 grains of No. 4198 powder, the sizes of two consecutive ten-shot 200-yard groups were 1.44 and 1.70 inches. Other phenomenal five-shot groups with this rifle were down to .35 inch, center to center, at 100 yards. This rifle had been checked for proper barrel and action bedding and the best of cartridge components were selected. The smallest group was obtained with 55-grain Sisk bullets and 24.5 grains of No. 4198 powder. The other 200-yard groups were made with 55-grain Moffat & Schmuck bullets and 24.0 grains of No. 4198 powder. The velocities of both loads are between 3500 and 3600 feet per second.

On the same day two groups of ten shots each were fired from another rifle, chambered for a shortened .300 Magnum case reduced to .25 caliber. The shoulder slope is 35 degrees. It is, so far, the most practical .25 caliber magnum that I know of. The two groups shown were made after about 1000 full-power loads had been fired through this barrel. Many other .25 magnums have been worn out in less than 500 rounds. What the answer is, I do not know.

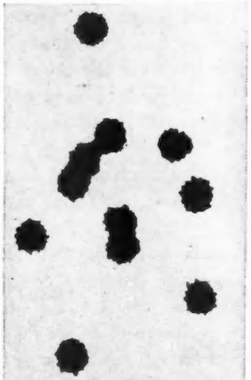
The two .25 caliber groups, made at 200 yards with Modern Gun Shop bullets, measure 1.90 and 1.95 inches, center to center. Note that there are eleven shots in one group. Excepting the one called shot, there are ten in 1.40 inches. With reasonable care on the shooter's part that kind of accuracy can be obtained regularly with these two rifles.

At least one barrel has been worn out in each caliber, and most of the shooting has been on targets to determine the most accurate combination for these cartridges. I could name possibly a dozen or more other cartridges which under similar circumstances would produce equally fine, but not record, results.

So much depends on the reloader, the rifle, and the shooter that I would make a bet that no one will ever know which is *the* most accurate cartridge. Too many items are overlooked, especially on the part of the person doing the reloading. Seldom do we use only one case for test groups, nor do we weigh the bullets or primers for uniformity. All of these items must be considered if we are to try to compete with already established records. We can do it, but I doubt that any of us will go to the same length as Clark, Rowland, or Pope to find out.



Five shots at 200 yards, bench rest, with .228 Ackley magnum. Bullet was 70-grain Sisk



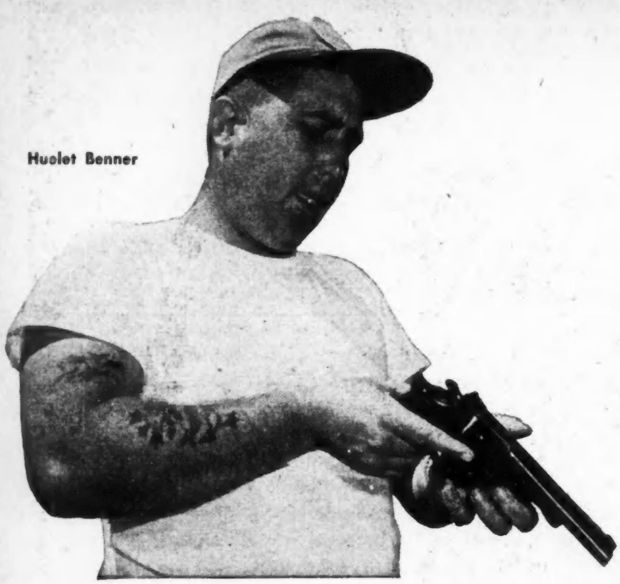
Eleven-shot 200-yard group with .25 short magnum. Top shot was "called out" by Barr.

Sometimes extremely important items for maximum accuracy, such as barrel and action bedding, are overlooked. Even barrel, chamber, and throating conditions are sometimes not considered. All of these points are extremely important when testing any of our more popular and accurate cartridges. I had one rifle which would group close to one and one-half minutes of angle. More than 3,000 rounds of handloads were expended through that barrel without promising results. That should have been enough to discourage anyone, but a new barrel on the same action for the same cartridge resulted in some of my smallest groups. The reference is to a Johnson Automatics .22 caliber barrel having four wide lands and correspondingly wide grooves. Not too much was expected of this barrel at relatively high velocity, but some of the groups made would indicate an exceptionally fine barrel, as shown by the targets made in this .22-30 rifle with the Springfield action shortened one inch for the cut-down .220 Swift case.

Sometimes a cartridge is not just what it should be, and for no known reason. In this particular instance I am referring to the .219 factory Zipper. As evidence of its unpopularity, no commercial rifle is made today for the cartridge. Yet it should be quite popular, considering bullet weight, velocity, and sound pressure level developed in this case.

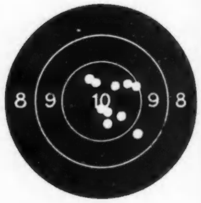
About ten years ago the Zipper was selected as being almost ideal for relatively high velocity and long barrel life. The disappointment came, though, after trying seventeen different rifles in .219 Zipper caliber. Only one of those rifles could be depended upon to give anywhere near minute-of-angle accuracy. The most consistent one of the lot was a high-wall Winchester single-shot formerly chambered for the .22-3000 Lovell cartridge. The Savage four-land and four-groove barrel was rechambered by Winchester for the Zipper. In it, the best of our handloads would make fairly consistent one and one-eighth to one and one-quarter inch ten-shot groups. None of the other Zipper rifles, including single shots and bolt actions, would do nearly as well.

Then came the pay-off. We had known about a number of satisfactory Zipper rifles, but the show-down of surprises came when friend Stan Young sent in his Sharps-Borchardt, which was barreled and chambered by Bill Staege for the standard Zipper cartridge. Judging from our previous experience with the Zipper, this rifle had nine out of ten strikes against it. And why not, after all the previous results we and others had obtained? *(Continued on page 36)*



Huelet Benner

mental MATCH CONDITIONING



By MAJOR ELLIS LEA

After more than ten years of coaching university and civilian rifle and pistol teams, I have come to the conclusion that mental training of shooters is looked upon and treated like an illegitimate child at a family reunion.

To begin with, mental training of shooters should start with their first lessons. It should teach them that shooting is a mechanical function controlled entirely by the mind. If we train the mind to perform its function properly through concentration and the development and maintenance of a "shooter's mind," we will be able to shoot match scores as good or better than practice ones.

Some coaches, accidentally or in half awareness of the problem, do develop their charges along mental lines and thereby reap a rich harvest in higher scores. For the most part, though, the coach is prone to ignore the ramifications of the mind in shooting and concentrate on the mechanical details, long past the point where profitable return to the shooter in the form of higher scores is possible.

Certainly the training in mechanical details such as positions, squeeze, sight alignment and adjustment must be taken care of, but we should go further.

I am of the opinion that we must open up the mental side of shooting if we are to raise the competitive averages of the bulk of the shooting public. Excellent articles by Lee Echols, Harry Reeves, and Walter Stokes, to mention a few, have done much in this line, but I believe that we do not yet know just how far we have penetrated into this field, and how much further there is to go.

What follows are my own observations and beliefs and represent only a peep through the keyhole at the subject. Personally, I hope this article will stir up violent reaction and much controversy for the benefit of all.

How many times have coaches found what they thought was a "comer" only to be disappointed later? After working for long periods of time grooming him for competition, discounting his early failures to come through because of lack of experience, they eventually come to the bitter conclusion that he will never hold up.

Some new shooters finally, by trial and error, or by accident on the coach's part, snap out of it and become good shots, i.e., able to stand competition without wilting.

When I shot pistol with the West Virginia State Police in the late thirties, we called competitive failures "barnyard shooters." Nearly every year when scores were submitted from the field to be used in picking the squad there would be new names blazing on the list. The old timers on the team would look, marvel, and start dry shooting to beat hell, mortally afraid the newcomer would hold up in the tryouts and shoot them off the team. It seldom happened that way though for, while these lads had the *mechanical* proficiency to produce high scores under familiar and known conditions, they did not have the *mental* conditioning to stand up and slug it out with the calm, more or less controlled veteran who had attained such conditioning.

Every year there were one or two who would come to headquarters for the tryouts and fail miserably. They often would not shoot within twenty to forty points of their average practice scores. Now and then a disgruntled candidate would report that *after* he returned home (and the pressure was off!) he fired a score that would have put him on the team.

Relatively few are ever able to rise above that "barnyard shooter" status. My point is that if more attention and research were given to *mental* conditioning, the shooting game would retain more of its borderline hopefuls who eventually drift off into something else in the hope of finding a hobby in which they can excel.

I doubt if anyone is forced into the shooting game. We shoot because we consider the sport fun, we wish to improve our skill for some practical reason, or we hope to excel in competition. We should not, therefore, forget ourselves or allow our students to forget that shooting is good fun, an extremely interesting hobby, and one that has many practical applications. We should do all of our shooting with this attitude.

When lack of proper mental conditioning or "shooter's mind" appears, it is variously called "the buck, pressure, jitters, ague," or the shooter is said to have "a monkey on his back." Regardless of the name, the symptoms are the same. The hands are sweaty and trembling, knees knock, there are butterflies (or fighting wildcats, according to degree) in the stomach and the patient wishes to hell he were any place but there. In its worst stages individuals get sick enough to almost vomit. Sometimes they do just that.

All shooters from tyro to master are subject to the "jitters," even Harry Reeves, Detroit policeman and three-time National All-Around pistol winner. Believe it or not. I once asked Harry what he concentrated on most while shooting. After a little reflection he said, "Trying to keep from getting scared to death when I get a good score going."

I knew just what he meant.

For example: In 1937 Corporal Ballard of the West Virginia State police team was firing the twenty-shot timed-fire match at Camp Perry, Ohio. Ballard's relay had completed their first ten and he was riding easy with a ninety-four or ninety-five. Just then he noticed another shooter, whom he knew had a ninety-nine, polling the line as to their scores. The ninety-nine was doubtless the best competition score this bloke had ever fired and he wanted to know how it stood. When this shooter got to Ballard the latter's dry sense of humor got the better of him.

"What'd ya get?" said the hotshot.

"Got 'em all," said Ballard.

"All of 'em?" repeated this shooter, his face falling.

"Yep," replied Ballard smugly, "I'm hot this time. It's in the bag."

That stopped the hotshot. Back he went to the firing point and the next time we looked at his target we thought he had turned his Poly-Choke to cylinder. He had one-shot groups all over the target!

So much for the end results of the lack of mental conditioning. Occasionally we all do stunts like this. A good competitive shot would have survived the ordeal of such a high score to start off with and would have matched it with another. As a matter of fact my teammate, Corporal William Beckett, shot a ninety-nine and a ninety-eight for a 197 out of 200 for the center-fire timed-fire record that same year. He started with the same score as the other man but he did not let it bother him. I say "did not let" advisedly, for I know it was a fight not to do so. I had been coaching Beckett at one time and he said, "if I were any more jittery they'd have to tie me to the shooting stand." Yet he could still shoot top scores. That is mental conditioning.

DID A GLANCE THROUGH HIS SPOTTING SCOPE KILL HARRY REEVES' CHANCE FOR ANOTHER NATIONAL PISTOL CHAMPIONSHIP?

I believe that concentration and the ability to keep a calm, balanced outlook are the two most important factors that make up a "shooter's mind." When I was first breaking into the pistol game, I found that my experience in rifle shooting was not much help. I would be "hot" one match and darn cold the next. When I was cold I seemed to be trying too hard. To offset this I used to say, and try to believe, that the whole thing was a big outing—nothing to take seriously or get upset about. Just a time for fun. That was to take care of the calm mental attitude needed for good shooting. It did not mean that I was careless or happy-go-lucky in my shooting. Far from it. I just tried to clear my mind so that when firing I could bear down on concentration.

As a coach and shooter there are certain mental devices I have used on myself and others to maintain that calm mental attitude. For instance, I have found that some high-strung persons can be held on the ground and good scores produced if a competent coach will stay with them and just talk constantly about *anything* in a low calm tone of voice. Occasional instructions are given regarding their shooting, but mainly the coach just keeps talking. This will annoy the quiet, phlegmatic type of shooter, so it is not the trick to use on him. Your excitable shot's mind will be kept off himself, off his score, and, as much as possible, on his shooting.

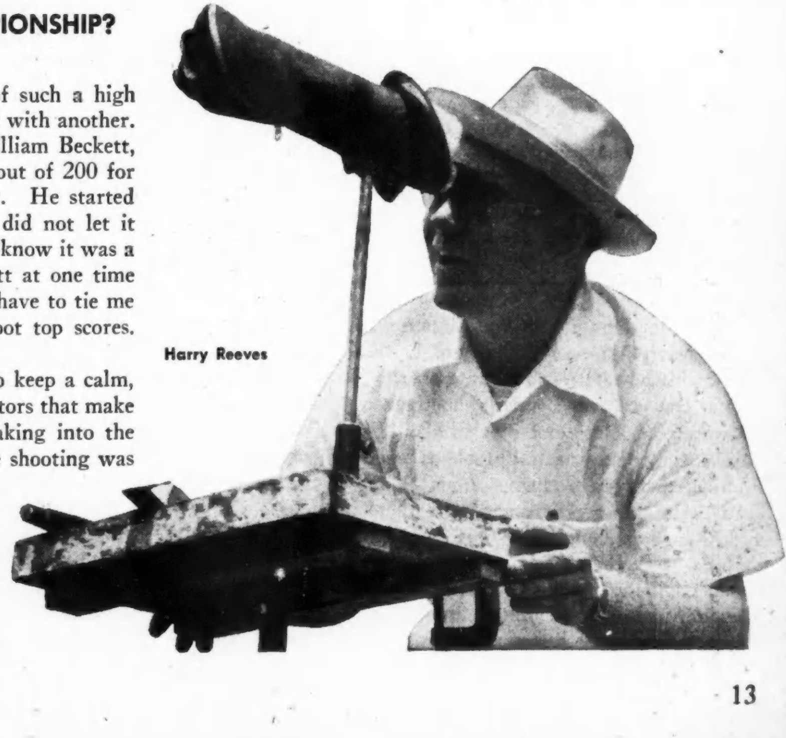
Other shooters will produce higher match scores if a coach uses a telescope to keep the groups centered and just reassures the shooters as to his group center, the time remaining, and other details. He does not tell the shooter what he gets or engage in any extra conversation.

I have found it possible to improve the standing scores of certain individuals by making a proposition like this.

"Let's pretend that we are going to bet real money on this shoot. You will shoot ten shots standing, each shot will be a separate match. If you get in the black I'll pay you fifty cents; if you drop out you pay me. Remember, only *one* shot at a time. Here is the first."

By making a shooter concentrate on one shot at a time, I often force him to eliminate all other thoughts but that one from his mind. It is easy to get one shot in the black at a time, so when the string is fired—one shot at a time—I always end the loser. This tickles the shooter, opens his eyes to the greater possibilities within himself and gives him the needed confidence (mental conditioning) to try for higher scores.

If a pistol or rifle shooter can be tricked or talked into shoot-



Harry Reeves

ing ten shots in the black, standing with the rifle, or at fifty yards with the pistol (critical stages), a very creditable score will result in ninety-nine cases out of a hundred.

These tricks and many others have been blindly used by coaches for years. Maybe I am poorly informed on this point, but I believe that most all know that the tricks work. However I doubt if more than a handful have looked very far into the reason why or attempted to generalize practice into rules or guides and thereby improve shooting results.

For my own part, when I am shooting my best, it seems to be the easiest thing I ever did. I concentrate on the right things. Squeeze and sight alignment are a matter of course. I have seen the time with the rifle and pistol when the knowledge that a perfect sight picture then existed was enough to cause the piece to fire.

"Thinking it off," we called it. Needless to say good scores resulted at such times.

When I am having the most trouble trying to keep sights in alignment, smooth out my squeeze, correct my position, worry about other shooter's scores, and my own average, my concentration scatters like a covey of quail with a fox in its midst.

Those who reach the top twenty-five with rifle or pistol have certainly found a formula for concentration and mental calmness. Our three-time National All-Around Pistol Champion, Harry Reeves, has said he never watches another shooter's target in a match. I believe that is Reeve's way of retaining his concentration by not being distracted by any high scores that might cause him to doubt or wonder if he could beat them.

It may or may not be significant but Reeves scoped Sgt. Huelet Benner, Fort Knox pistol ace, in the Orton (.45 National Match Course) at Camp Perry in 1947. This was the last match of the All-Around Championship. At the Detroit Regionals Benner had beaten Reeves, and I think Reeves knew Benner was making it a good race at Perry before the firing of the Orton. Perhaps the reason Reeves was dethroned at Perry was because he looked back and started worrying, even as you and I. Reeves *may* have lost some of his power to concentrate on the job at hand because of some concern over Benner's shooting.

Having coached and fired on pistol teams for the last eleven years, Major Ellis Lea is thoroughly familiar with the problems, both mental and physical, of the man on the firing line. Last winter his first-year pistol team at the University of Wisconsin won eleven and lost five matches; it also finished fifth in the National Intercollegiate Pistol Team Match. Lea will follow this article with one on the physical conditioning of a pistol shooter.

I believe shooters and coaches should open their eyes and make a study of the mental problems besetting a shooter. The difference between a champ and a chump is the letter "U" (you). In this regard, somewhere there must be a shooter-student casting about for a subject upon which to report for a master's or doctor's thesis in psychology. I suggest that that person might do well to take as his subject "mental attitudes attendant upon high shooting scores."

I further suggest someone, anyone, see that such thesis is not buried in the archives of the university but published for the benefit of all shooters (in THE AMERICAN RIFLEMAN).

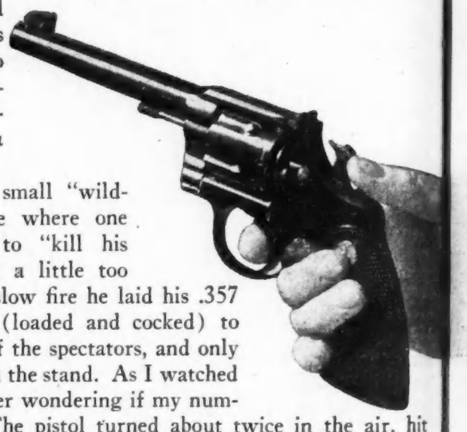
Shooters must not be allowed to grope in the dark—they must know that it is just as important to maintain a calm mental attitude and an intense degree of concentration when shooting as it is to "keep the left elbow under the rifle" or "the pistol straight with the arm."

By using any trick or statement that will reach and impress them, the shooter must be helped to the conviction that shooting is a grand *game* and win, lose, or draw it is still *fun*.

Remind the shooter constantly, until he has absorbed it, that the target does not shoot back nor does his competitor shoot at him. Tell him he is shooting against score, which is really himself, and that if he can perform certain mechanical functions and concentrate on his tasks he will be able to shoot good scores.

Aids to concentration such as ear plugs, good shooting glasses (ground to prescription if needed), proper clothes, good weapons, and ammunition should be recommended to each shooter when he is ready to use them. Don't scare him away from the game in the first month by recommending $300 worth of equipment. The shooter should be told *why* these things are important.

No article such as this would be complete without a warning of pitfalls. Some shooters, attempting to produce "shooter's mind" in a match have resorted to the use of liquor, barbiturates, and other drugs to settle their "nerves." As far as I am concerned, they are crutches and will only accentuate the weakness the shooter hopes to overcome. I have never recommended them. Use of such false supports, I have observed, snowballs until large amounts have to be used to accomplish a result formerly obtained with a smaller dosage.



I attended a small "wildcat" match once where one shooter, trying to "kill his nerves," imbibed a little too much. During slow fire he laid his .357 Magnum down (loaded and cocked) to talk with some of the spectators, and only laid it halfway on the stand. As I watched it fall, I remember wondering if my number were up. The pistol turned about twice in the air, hit the ground and went off. That drop took a long time, brother. Only God knows where that slug went.

Understand, this is an exceptional and extreme case in my knowledge and experience but it makes the point. Drink, dope, and gunpowder don't mix.

Once a team match was almost lost because one of the team members had taken so much nimbutol to quiet his shakes that he could barely be awakened in time to shoot.

Personally I feel that if I have to do these things to shoot well and enjoy the sport, there is either something wrong with me or with the sport. At least this matter is something I believe can be eliminated by proper training and coaching.

Many shooters have been started *(Continued on page 35)*

SIXTH IN THE RIFLEMAN'S SERIES OF ARTICLES ON POPULAR AMERICAN CARTRIDGES

Jim Berryman

The .30-'06 IS NEVER A MISTAKE

By COLONEL TOWNSEND WHELEN

THE .30-'06 IS NOT a specific rifle, nor a specific cartridge. The numerical designation ".30-'06" applied to a rifle merely means that it is bored and chambered according to the standards established by the Ordnance Department of the U. S. Army in 1906 for the "Ball Cartridge, Caliber .30, Model of 1906."

Since its adoption I imagine there have been over a hundred distinctive cartridges produced by the Ordnance Department, its contractors, and the commercial cartridge companies that will satisfactorily fit in .30-'06 rifles. Rifles for the .30-'06 series of cartridges also present a varied picture. Most of them have been more or less "remodeled" or custom built, resulting in all grades of quality and efficiency. The performance of Springfield service rifles, and Springfield Type T and Winchester Bull Gun target rifles is well known. I shall confine myself here to a discussion of the sporting rifles of this caliber.

With writers it has been customary of late to malign the .30-'06. Some have declared that it is not powerful enough for game larger than deer. It has had few defenders; perhaps because the large body of sportsmen who have been using it with perfect success for forty years consider that its efficiency may be taken for granted, and that it needs no defense. Looking over the years from 1906 to date it is apparent that the .30-'06 has been used by thousands of American sportsmen the world over, on all but the heaviest African game, with most perfect results. Some have killed thousands of head of game with it, *and continue to use it.*

Though past seventy, Colonel Townsend Whelen's interest in shooting has never flagged. This past year he has edited the anthology, Hunting Big Game, *and published the concluding volume of his* Small Arms Design. *He is an Associate Editor of* Sports Afield.

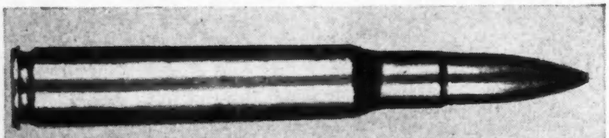
My late friend Ralph G. Packard killed over five hundred head of American and African game with his .30-'06 and the Remington cartridge loaded with 220-grain "Delayed Mushroom" bullets (no longer made). One day he killed, with three shots, two African bull buffalo that charged him.

Stewart Edward White used both the .30-'06 and the .405 Winchester rifles on his many long trips to Africa. With the two he shot hundreds of head of game, including over fifty lions. He said, on his return from his last trip, that if he were going to Africa again he would take the .30-'06 and leave the .405 behind, provided he could get the Western cartridge loaded with the 220-grain soft-point boattail bullets (also no longer made). African big game, size for size, is notoriously harder to kill than American.

Harold Lokken, a Yukon sourdough, probably killed more

American game, moose, grizzly, caribou, sheep, and wolves, with the .30-'06 than any other hunter. His exact record died with him, but from long conversations we had, I believe the total certainly included fifty grizzlies, on none of which he had to expend more than four of the same type cartridges used by Mr. Packard.

Perhaps one who attempts to evaluate a rifle and cartridge should give his own experience. My Army, competitive, and ballistic work with the .30-'06 over the past forty years is well known to most readers. My hunting experience has been less than that of many others but, as accurately as memory serves me, includes the following:



The .30-'06 cartridge dates back to 1903 when it was developed by the War Department for use in the then newly designed service rifle known as the U. S. Rifle Caliber .30 Model of 1903. The 1903 ammunition was loaded with a 220 grain bullet to a muzzle velocity of 2300 feet per second.

In 1906 the War Department adopted a 150 grain bullet having a "spitzer" point loaded to a velocity of 2700 feet per second. During World War I the light 150 grain bullet was found to have insufficient range and in 1925 a 172 grain, 9 degree boattail bullet was adopted to replace it.

The War Department reversed itself in 1940 and went back to a light 152 grain bullet very similar to that used in the M1906 ammunition. This bullet is still standard in the service for ball-type ammunition.

The .30-'06, in addition to being standard in our military services, is also one of our most popular sporting cartridges. The ammunition companies for several years have loaded a 180 grain bullet in the .30-'06 case for target shooting. They have also met the hunters' demand for expanding bullets in four different weight classifications: 110, 150, 180, and 220 grain. Not all of these are now available.

One bull elk killed in one shot with the 172-grain full-jacketed, pointed Hudson-Thomas bullet (2700 feet per second velocity).

One bull moose in three shots, three deer in one shot each, four peccary in one shot each, and six crocodile in one shot each with the old 172-grain Remington "Umbrella Point" bullet (2600 feet per second velocity).

Four moose in six shots, one grizzly bear in one shot, one caribou in one shot, two mountain sheep in one shot each, four mountain goats in eight shots, and eleven deer in twelve shots, one a miss, with the Western factory cartridge, 180-grain open point boattail bullet (2725 feet per second muzzle velocity).

One bull moose in one shot with the Peters factory cartridge, 225-grain belted bullet (2400 feet per second muzzle velocity).

Two deer in one shot each with the 172-grain Western Tool and Copper Works open-point bullet (handloaded to give 2750 feet per second velocity).

I completely missed one moose, one deer, and one goat. The moose and deer were running shots. The shot at the goat was most difficult, up a 30-degree slope, only half the goat's body showing over a ridge, and me doubled up like a jack-knife in a foot of snow on which a dazzling sun beat down. I had no failures to kill well, in most cases at once. All of the above were shot at distances under 250 yards, except the four goats which happened to be all at between 300 and 400 yards.

During my wilderness hunting I have invariably also carried cartridges loaded with the 150-grain, pointed, full-jacketed, service bullet with a powder charge to give them a muzzle velocity of 1500 feet per second. With these cartridges I have satisfactorily killed a large amount of small game.

Today the only factory-loaded .30-'06 cartridges being made for sporting purposes are those manufactured by Remington-Peters loaded with 180-grain (2700 feet per second) and 220-grain (2400 feet per second) "Core-Lokt" or "Belted" bullets (practically the same), and the Western-Winchester cartridges loaded with 180-grain (2700 feet per second) and 220-grain (2400 feet per second) "Silvertip" bullets. Reports from the game fields during the past six years indicate that these loads give killing effect at least equal to that of any previous bullets of equal weight, fired at similar velocity.

These loads should be regarded as perfectly satisfactory in all respects except one: they are all round-nose bullets. Efficient sharp-pointed game bullets in .30 caliber are greatly desired. Most of those previously made were not noted for accuracy or killing effect. The old 172-grain Western Tool and Copper Works open point bullet had practically a sharp point and, loaded to shoot at 2800 feet per second, I would sooner have it for general shooting than any other bullet I know of. Hosea Sarber of the Alaskan Game Commission has used this bullet for years and swears by it. I have only killed two deer with it, but have killed two moose and four deer dead as the proverbial door knob, with a single shot each, using its counterpart, the 130-grain .270 caliber.

I fear I have a rather poor opinion of the .30-'06 as a woodchuck and varmint rifle, not because of any lack of accuracy and trajectory, but merely because of too much racket and too many ricochets. But as a rifle for all American big game, when used with good loads, I do not believe it can be excelled.

The .270 Winchester, with modern loadings, almost equals it in killing power and has a slightly longer sure-hitting range due to its accuracy and trajectory. The .300 Magnum, described in the November, 1946, AMERICAN RIFLEMAN, has greater killing power and would be preferred perhaps for Alaskan brown bear, but its recoil is such that many sportsmen dread it and do not shoot well with it. Where the cartridge is anywhere near adequate for the game being hunted, marksmanship is a much more important factor in killing power than anything else. I think that it is correct to state that .30-'06 recoil is found to be a little severe by about ten percent of our sportsmen; but this ten percent are all those who have not had the advantage of training in marksmanship.

With any rifle, ability to hit game at long and estimated distances depends on the marksmanship of the sportsman, and on the accuracy and trajectory of his rifle and

cartridge. With poor rifles and good ammunition, and vice-versa, I have seen some gosh-awful groups fired by good shots. Likewise I have seen a lot of poor accuracy where the only trouble was that the rifle was not properly bedded in its stock—a most important detail applying to all rifles of all calibers, and one that everyone but the best informed rifleman is likely to overlook.

My old Springfield, which was Lyman sighted, invariably shot into at least 2½ minute-of-angle groups with the Western 180-grain open point boattail cartridge with which I did most of my hunting. It shot slightly better than this with the Western 220-grain soft point boattail bullet. From 1925 to 1934 I found that some of the factory cartridges being made would not give much better than 3½ minute-of-angle groups even when fired from Mann barrels. The best accuracy I ever obtained with any sporting bullet was with the old 172-grain Western Tool and Copper Works open point bullet—equal to Palma Match ammunition.

My experience with the most recent loadings of Remington, Peters, Western, and Winchester sporting ammunition, 180- and 220-grain bullets as described above, has been that in first class sporting rifles aimed with hunting scopes it will all group in about 1½ minute-of-angle groups. This is most satisfactory accuracy, and better than we have ever had before from sporting factory ammunition.

Assuming a scope mounted rifle with the scope axis 1¼ inches above the bore axis and the rifle sighted to strike point of aim at 200 yards, the practical hunting trajectory will be as follows:

180-grain pointed bullets, loaded to shoot at 2700 feet per second muzzle velocity, will average striking 2.37 inches above line of aim at 100 yards, and will drop about 9 inches at 300 and 24 inches at 400 yards. Similar round nose bullets will drop about 11 and 27 to 30 inches at 300 and 400 yards.

220-grain round nose bullets, loaded to give 2400 feet per second muzzle velocity, sighted for 200 yards, will rise 2.87 inches at 100 yards, and then drop about 13 and 36 inches at 300 and 400 yards.

At present the flattest sporting trajectory practical with existing powders is obtained with a 150-grain pointed bullet, loaded to shoot at 2950 feet per second. There used to be such a factory cartridge on the market, and it will probably be offered again before long. When sighted for 200 yards it will rise 1.87 inches at 100, and drops off 8 inches at 300 yards and 22 inches at 400. Practically, this is no better than the 180-grain pointed bullet. This speedy 150-grain bullet might give a slightly larger proportion of instantaneous kills on deer, and be slightly less effective on elk, moose, and grizzly than the heavier bullet. However, it would be hard for me to imagine more instantaneous kills on deer than with the 180-grain bullet. Personally I would choose to shoot the latter weight for everything and not be bothered with different sight adjustments for two cartridges.

If you will analyze the above trajectory and accuracy it can be seen that you may aim for precisely where you wish your bullet to strike up to about 225 yards, with no effort or delay to estimate distance. If you think the range is a little long, aim a little higher but not off the animal's body. If the distance appears very long, aim even with the top edge of the animal above its heart area. If you do your part correctly these rules of thumb will always result in a vital hit at practical ranges.

From long experience I would say the killing effect of all .30-'06 bullets begins to diminish rapidly beyond 350 yards. That is the sure-hitting, humane-killing range for big game shooting. The only rifle which excels this is the .300 Magnum with a barrel heavy enough to make the assembled rifle weight about 11 pounds. An 8½ pound .300 Magnum is not as accurate as a .30-'06 of the same weight. A .270 Winchester at its best will have a longer sure-hitting range, but not a longer sure-killing range.

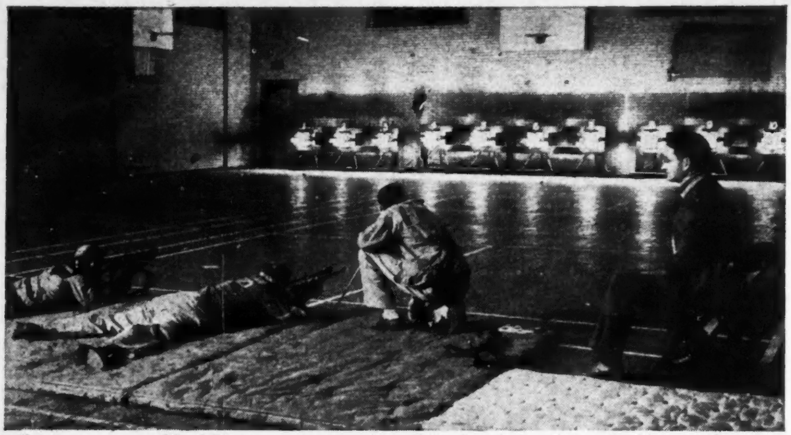
The accuracy life of a good .30-'06 barrel, fired as a sportsman uses it, and properly care for, is 4000 to 5000 rounds of full charged cartridges. With all modern bullets there is no lumpy metal fouling. After firing Government ammunition the bore should be water cleaned not later than the evening of the day on which fired. After firing sporting ammunition it should be solvent or oil cleaned, for while there is nothing in the fouling of this non-corrosive ammunition to cause rust, there is nothing to prevent rust from damp air.

My experience in reloading and hand loading .30-'06 is that one runs into less trouble with them than with any other cartridge, because they are so uniformly made on Government specifications, and do not differ so much in quality and dimensions as do cases of the other calibers. Fired cases seem to be almost everlasting.

In the hunting field I consider a light cover, made of the lightest waterproof cotton material such as is used for the lightest tents, a very desirable accessory. It will protect the rifle from rain, fog, and snow, as well as from dew at night in camp. It will also keep the stock from warping, and possibly changing zero and accuracy. It weighs and bulks no more than three handkerchiefs.

At the present writing the only .30-'06 rifle that can be bought "over the counter" is the standard Winchester Model 70, a splendid foundation on which to build an excellent sporting rifle. If, as usual, it comes fitted with crude open sights, better sight equipment is highly desirable. Perhaps one in ten rifles will require some attention to the bedding, but this is only to be determined after targeting for accuracy. Other .30-'06 rifles are usually remodeled or custom built, utilizing the Springfield 1903, Enfield 1917, Remington 30 or 720, Winchester 54 or 70, or Mauser 1898 breech actions. A choice between these actions depends entirely upon the personal preferences of the future owner. I have seen hundreds of most-excellent rifles built on all of them. The efficiency of a remodeled or custom built rifle depends entirely upon the skill and integrity of the workmen involved.

I shot most of my game with the .30-'06 before the days of motor cars and planes, and before I had the money to hire guides. I guess I carried it a hundred miles afoot, on my shoulder or in the crook of my left arm, for every head of game I shot. At night I often sheltered it under my blanket. I got to love it as I have loved no other rifle since. And you will too if you get a good one and have it deliver the bacon year after year, with never a suspicion of a failure. I can only reiterate that the .30-'06 is never a mistake. ◆ ◆ ◆



Bullet traps on movable dollies convert gymnasium of Harding Junior High School into a rifle range

THE BIGGEST OBSTACLE TO SHOOTING IN PUBLIC SCHOOLS IS THE COST OF RANGE CONSTRUCTION. CLEVELAND'S HARDING JUNIOR HIGH SCHOOL USES IMPROVISED BUTTS THAT CAN BE MOVED IN AND OUT OF THE GYMNASIUM

By CHARLES L. RUSSELL

GETTING THE RANGE

RECENTLY, WHEN A PERT little school librarian asked for the purchase approval of C. E. Chapel's *Gun Collecting,* she was confronted with a scowl.

"Do you mean that you would permit junior high boys to read such a book?" asked her supervisor.

"Goodness, why not?" remarked the librarian. "They've been shooting real guns at our school for years!" And such have been the obstacles of the Harding Junior High School Rifle Club, of Lakewood, Ohio.

The largest task in establishing our club was not that of financing it, nor finding a place to shoot, nor was it a case of convincing the school officials. The real task lay in the securing of city approval. Blueprints had to be submitted to the city engineers, revisions made, questions answered, and the Mayor convinced of the need of a rifle marksmanship program.

All this trouble occurred in the prewar days of 1939-1940. Such a program can be brought into other schools only through the efforts of some willing faculty member. Lakewood schools would be without a shooting program today except for the efforts of the writer and the enthusiasm of Mr. Walter Wasmuth. Some rifle-shooting faculty member must start the program and keep it going. I have seen cases in our city in which the students started the program—and then an uninterested faculty member was assigned as coach. It failed each time. In addition to the usual problems, there will be opposition at every point. It takes an experienced rifleman with all the answers to meet this opposition.

Many clubs experience the lack of funds or financial backing at their outset. This was true in our case. We had rifles, backstops, lights, mats, and other equipment to buy at one time. Then there was the unwillingness of others to vacate the rooms assigned to our use. In establishing any new program such as this, one almost always crowds another organization or encroaches on someone's time. This invariably creates trouble. A broad-minded administrator will, however, weigh the value of the two programs and select the more worthwhile one.

Yes, we had all the above trouble, and because of the involved difficulties we were crowded into a small gymnasium storage room 15 by 48 feet. With the aid of the American Ship Building Co., we were able to construct fine backstops for three-position shooting on three firing points. We installed proper lights, painted the room, built a ventilator duct—and, well, before you knew it, we were the most "sought after" organization in the entire school system. Parental and public approval became so great that we could no longer be kept in a back storage room. At this point several dancing and table tennis classes were moved out and we were moved into the school gymnasium.

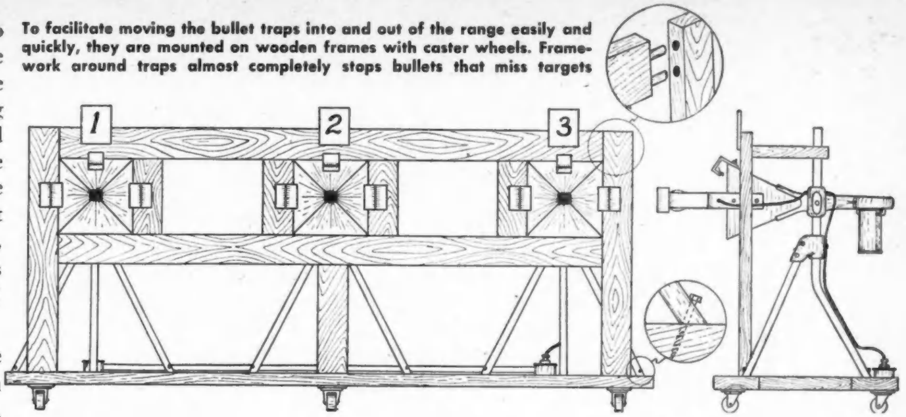
Within seven years we have developed one of the finest school ranges in the country. The gymnasium is about 60 by 80 feet, well-lighted, ventilated, and sound-proofed. All wall structure is of brick. Entrances are at the rear and well back of the firing line. Prone mats are regular heavy gymnasium mats. With a 60-foot room width, we can comfortably accommodate ten firing points.

Our first problem in developing this range was the securing of an adequate backstop . . . adequate in that it had to be safe, easily moved, and easily stored. We decided to use the 10X Centrifugal Bullet Trap. We purchased ten of the 12-inch square, individually lighted units. Had we sufficient funds, we would have purchased the 18-inch square traps because they handle the ten-bull tournament targets more readily and they are much more practical with junior shooters.

The only major criticism we have of the 10X traps is their awkwardness in being moved or handled. This was a big problem, since our gym is used for some type of training every period of the day. In order to allow sufficient time for shoot-

A science teacher and junior rifle instructor in the Harding Junior High School in Cleveland, Ohio, Charles L. Russell is also a member of the Lakewood Rifle and Pistol Club, and does gunsmithing on the side. He has been instructor of the Harding Junior School Club since its organization in 1940. Russell is listed as an Expert rifleman in the current NRA Classification Book.

To facilitate moving the bullet traps into and out of the range easily and quickly, they are mounted on wooden frames with caster wheels. Framework around traps almost completely stops bullets that miss targets



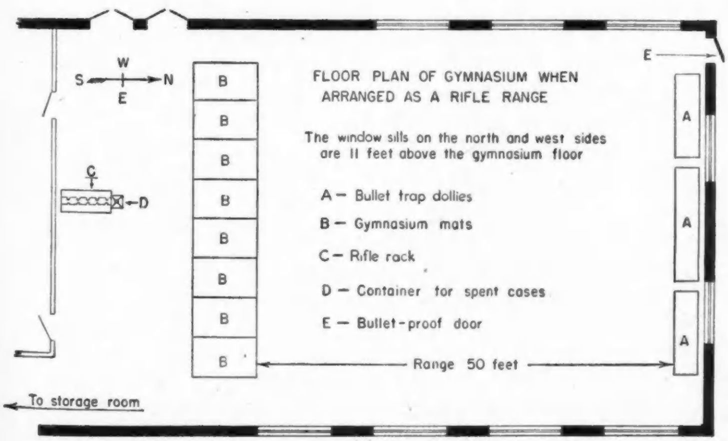
ing in any one period, we have to be able to move into or out of the gym in five minutes—hence, we could not be troubled by dragging ten individual bullet traps to and fro. Our solution came in the form of three dollies. These were constructed in such a manner that No. I dolly carried traps 1, 2, and 3; dolly No. II carried traps 4, 5, 6, and 7; and dolly No. III carried traps 8, 9, and 10.

The bases of the dollies were made of choice 2-inch by 6-inch and 2-inch by 8-inch white pine, with mortised-and-tenoned joints. Dowel-joints may be used by those not having machinery to do the mortise-and-tenon job. Sufficient brace work should be installed to prevent warpage. The bases were then equipped with three and four sets of large rubber casters. A sturdy and well-built caster is an essential.

The 10X traps are furnished with a heavy pipe tripod. These we properly positioned on the dollies and secured at the base with long lag screws. The dollies were then wired with BX or regular conduit cable. Removable "jumper cords" are used to make electrical connections between dollies. This, then, necessitated the installation of but one electrical outlet in the gym wall.

Do bullets ever miss the trap? Yes, occasionally a beginner will miss the entire trap. Then the bullet will hit the hard brick wall, flatten, and drop to the floor. We have never had a ricochet. But, to lessen the possibility of a ricochet from the brick wall back of the target butts, we faced and enclosed the area around the front of the traps with heavy 2-inch pine boards. This slows the bullet sufficiently so that it scarcely marks the wall upon striking it. Before installing the panel work, we had numerous shots strike the wall but never ricochet. The panel work also adds a great deal to the balance, rigidity, and appearance of the butts. The entire backstop is covered with a non-glare black lacquer.

If you carefully check the illustrated floor plan, you will note many windows in our range. The city engineering department has agreed that these windows are high enough and so positioned that should a bullet ever pass through one, it would do no damage to the surrounding neighborhood. We have never had a bullet come near these windows. Our only wild shots have been those caused by a beginner not properly aligning his sights. These shots miss the traps by a few inches. They are now absorbed by the panel.


FLOOR PLAN OF GYMNASIUM WHEN ARRANGED AS A RIFLE RANGE
The window sills on the north and west sides are 11 feet above the gymnasium floor
A — Bullet trap dollies
B — Gymnasium mats
C — Rifle rack
D — Container for spent cases
E — Bullet-proof door
W
S
N
E
C
D
E
B
A
Range 50 feet
To storage room

Harding's club owns a variety of target rifles so that boys of all sizes and ages may be properly equipped. We have a few match-grade Model 69 Winchesters for the little fellows. The rest include the Stevens Model 416, the Remington 513, and the Winchester Model 75. This gives the boy a chance to select not only the rifle that will fit him but to determine from firsthand experience the outstanding qualities of each. Manufacturers could certainly profit from the findings of these boys.

Rifle marksmanship is taught each day just as Latin, English, or mathematics might be. This is done during school hours and regarded as any other class. Beginners are given one semester of basic training before being taken to the range. Oral and written examinations are given, thus weeding out the undesirables before permitting them use of the range. After this period, the beginners are placed on regular squads with older members acting as coaches. (The second semester is a probationary range period.) If desirable progress is shown, they are permitted to go on to their third and fourth semesters and advanced team work.

Our entire club is divided into teams. There is but one team on the range per period. Each team is divided into three relays. Each relay has a captain and is in charge of a specified detail. Relay 1 has charge of rolling out the target butts and making the necessary electrical connections. Relay 2 places the mats in position. Relay 3 gets out the rifles and the portable rack. This requires about three minutes, but it takes slightly longer when returning the equipment.

Is the Club accepted by the students and parents? I'll say it is! It is a battle royal each year to know how to limit the size of the beginning club. We train about 90 new boys per semester. Parents come on bended knee seeking admission for their youngsters. The club is financed by charging each member $2.00 per school year. This carries us nicely. Should we wish to make a large purchase or improvement, the Board of Education will finance the deal for us.

(*Continued on page 43*)

PROBLEMS with CAST BULLETS

By H. GUY LOVERIN

MANY TIMES THE question has been put to me about what diameter cast bullet to use. From my own experience, I will try to explain why cast bullets should be .002 inch to .004 inch larger than groove diameter of a barrel.

By far the most important reason why a cast bullet should be about .003 inch oversize is: Upon firing, the bullet is sized to groove diameter in the barrel, at once forcing the lubricant in the grease grooves of the bullet out where it is needed most. If bullets of only groove diameter were used, no sizing would take place, and no grease would be forced out of the bullet's grease grooves except by the lands of the barrel; this small amount of lubricant will not keep a rifle from leading except when using loads of only moderate velocity.

I have had reloaders tell me they knew their barrels were getting enough lubrication because they had recovered bullets at the targets and found the grooves full of grease. There is food for a lot of experimenting in these remarks. We need more bullets with shallow grease grooves. These would give a better balanced and a better lubricated bullet because the resizing which takes place in the barrel would force most of the grease out of shallow grooves.

I also believe our .30 caliber gas checks are made of material that is too thick. A new line of cast bullets with narrow bands, shallow grease grooves, and thin gas checks would meet with general approval. (See Note.) It would also be a great improvement if gas checks and bullet bases were of the correct size so the gas check on a sized bullet would be only .0005 inch to .001 inch oversize and all the other bands .002 inch to .004 inch oversize. This would reduce the upsettage which takes place under the gas check as the bullet is sized in the barrel upon firing and thus deliver the bullet with a more perfect base. Ideal bullet 225438 meets these suggestions, and a lot has been written about this great bullet. In hollow point type this bullet has terrific killing power. It just blows 'em apart, which few other cast bullets will do.

My .22 and .25 caliber rifles take very heavy loads of powder with cast bullets; this is probably because of six narrow lands and slower twist. But my .270 Winchester and .30-'06 immediately cause leading troubles when I attempt to use the same ratio of powder and lead. Nineteen grains of 4198 behind a 70 grain cast bullet doesn't cause leading in a .257 or .250-3000, but try using above 24 grains behind 154 grain bullets in a .30-'06 and trouble begins to develop. Since most .30 caliber rifles have only four lands, this leaves four wide grooves which do not get as well lubricated as the six narrow grooves of .22's and .25's; therefore, we can't get as high velocity from .30 calibers with gas checked bullets as from .22's and .25's.

Since the most satisfactory way to reload cast bullets is to reduce case necks only enough to hold them securely and evenly, we have another advantage in using bullets .002 to .004 inch oversize: The necks need less resizing and this lesser amount of resizing is more liable to be done exactly concentric, with better reloads resulting.

Many reloaders who do a lot of experimenting use different sizes of cast bullets as well as different tempers to regulate the burning of smokeless powder. Du Pont Shotgun smokeless is a very accurate and economical powder for some of the lighter reduced loads, and works best with bullets about 30 percent to 40 percent softer than regular mixture and only .002 inch oversize. One of my best light loads in my .30-'06 is 6½ grains Du Pont Shotgun powder with a plain base bullet of about 146 grains cast soft. Du Pont Pistol Nos. 5 or 6 are powders which also do very well under similar conditions, but I would suggest using bullets only .002 inch oversize and not too hard with these quick powders. I also suggest using pistol primers with these quick powders. If more powder and speed is required, use rifle powders and plain base bullets; for even more power, we must use gas checked bullets. Years ago one customers wrote that he got very good results with 12 grains of Pistol No. 5 behind the Ideal 311316 bullet in a .30-'06. This should have made a fast load. So far the best load I have found for an old .32-35 is eight grains of Du Pont Shotgun powder and a 146-grain soft bullet about .0005 undersize. This is an unusual rifle and problem to be experimenting with in this modern age. It took many tests to get this rifle to shoot but I think the experience was worth it.

My .270 Winchester does very well with 24 to 25 grains of 3031 and Bond No. 280780 Bullet; in cold weather I sometimes add 1½ grains Pistol No. 5. Unique powder is good for reduced loads in cold weather, but it keeps a barrel very hot in summertime even in loads as small as eight grains in .30-'06.

Recently I hunted deer in Vermont. I carried my .270 Winchester Model 70 loaded with *(Continued on page 28)*

BEAR FACTS . . . . *By Johnson*

"The bear season doesn't open for two days!"

Note: Possibly I haven't made myself clear on this point, but here is the idea I wish to put over. Say we have before us a .30 caliber bullet "as cast" and with the gas check affixed, ready to size and lubricate. The gas check should mike .309 inch and the bands .311 inch to .312 inch, not .314 inch to .315 inch.

Bullet mould manufacturers make their cherries large so they can cut more moulds before the cherry has to be discarded. This idea is wrong because it makes moulds that give wide variation in the "fit" of the gas checks, as well as the size of the bands. Factories should charge enough for their product that they can put out moulds of correct size.

Sizing .314 inch cast bullets down to .311 inch wears out dies very fast. This brings up another point: At what size should one throw away his sizing die, at .311½ inch or .312 inch? It is quite some job to size .314 inch to 3.11 inch in light bullet sizers and lubricators and do it exactly concentric.

FOR DEER HUNTERS . . . WHICH RIFLE? WHICH CARTRIDGE? WHICH BULLET?

HUNTER'S CHOICE!

By JOHN S. ROSE

Here is the final installment of the NRA's deer-kill survey, in which reports from approximately 4,500 successful big-game hunters have been analyzed. In a preceding article ("Stop That Buck," AMERICAN RIFLEMAN, *October, 1947) the locations and effects of bullet wounds were compared. Contrary to time-honored belief, the study showed conclusively that the neck is a far deadlier target for deer hunters than the favored heart area. Now, in the second of John Rose's articles, further facts emerge . . . to serve as a guide for that next-season deer hunt, and to help this year's unsuccessful hunter analyze the reason behind his failure to bring home a buck.*

☆ ☆ ☆

AS FAR as the majority of NRA members are concerned, a tried-and-true hunting companion is slipping into the limbo which has already swallowed up the single-shot rifles and black-powder hunting loads of past generations. The old .30-30 lever-action, beloved of generations of hunters and gun owners, is slipping—and the new favorite is the faster, deadlier, bolt-action .30-'06. Admittedly, NRA members as a group are the best-informed gun owners in the world, and today's trend away from the lever action, with its comparatively low power and modest velocity, should come as no surprise. Hunters, 1948 model, want bolt actions and fast loads!

As far as specific cartridges are concerned, the NRA's popularity poll shows that the 180-grain .30-'06 load is far ahead of all others. More deer were reported killed with this cartridge than with the combined total of its three closest competitors: the 170-grain .30-30, 180-grain .30-40, and 180-grain .300 Savage.

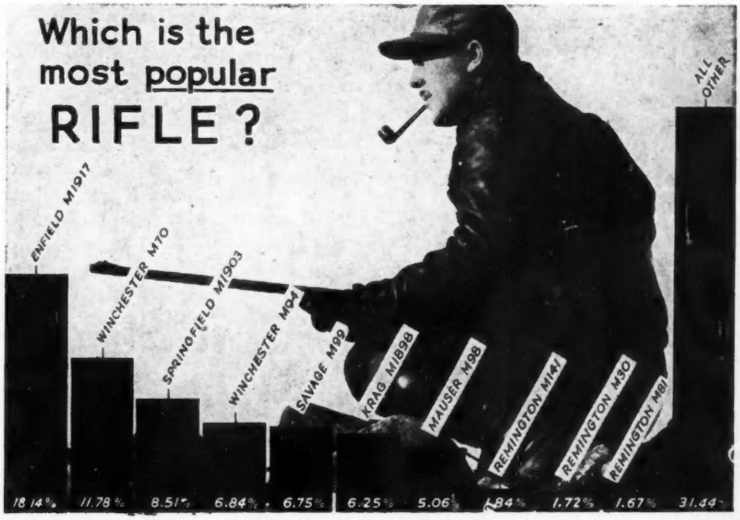
In considering these facts, a grain of caution is called for. NRA members are *not* average hunters. Most of them have had the opportunity of buying a good bolt-action rifle from the Government at a low price. The comparison between bolt action and lever action within the NRA membership is bound to be heavily in favor of the more modern arm.

Apparently, however, the .30-30 is slipping in popularity among hunters generally, regardless of whether or not they happen to be NRA members. In analyzing the NRA's several thousand reports, one can disregard *all* Government rifles and the .30-'06 still comes out ahead, although its lead is naturally less. Specifically, users of the 180-grain .30-'06 combination, minus all of those who used Government rifles, made up better than 13 percent of the total, as compared with a bit over 12 percent for the most popular lever-action combination—which was the .30-30 with the old standby 170-grain bullet.

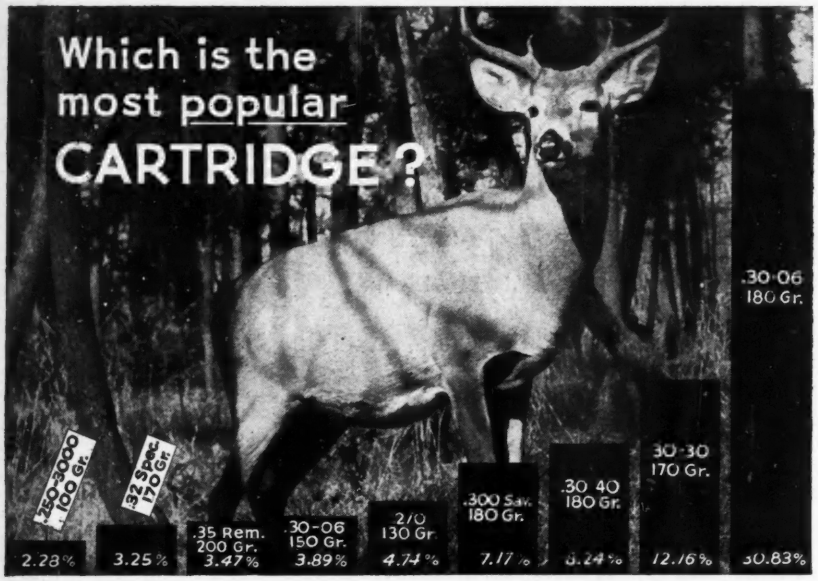
If we lump together all of the various weights and types of bullets for each cartridge, we come up with yet another strike against the popularity of the .30-30. Here the various .30-'06 rifles lead .30-30's, 15 percent to 13 percent.

In third position among our popular deer cartridges is the old .30-40 Krag, which is holding its own very well in competition with our newer loads. This will be an old story to anyone familiar with the fine accuracy and smooth-handling qualities of a Krag Sporter. In all probability, the popularity of this veteran of a half century of sporting and military use is limited only by the fact that it is no longer made and the supply is gradually disappearing.

The popularity of various other cartridges is shown in the graph on page 22. Local areas, of course, are bound to vary from these nationwide averages. In some regions the .30-30 undoubtedly holds a head-and-shoulder lead over any other caliber. On the same side of the ledger, it is entirely possible that a gun dealer in central Texas might argue that the .270



Here, in graph form, is the result of the NRA's survey of deer rifle popularity. Miscellaneous column at right includes everything from shotguns with slug loads to auto pistols



The 180-grain load in .30-'06 caliber was by far the most popular deer cartridge among NRA members last season. Graph opposite shows that 180-grain was by no means the most efficient bullet

should show up in a far better light than the figures indicate. As a matter of fact, if any cartridge overshadows the .30-'06 in future popularity, the .270 is a likely candidate.

As far as specific rifles are concerned, modern bolt actions are far ahead of the others in popularity. If we again disregard the obvious popularity of the Springfield and the 1917 Enfield, the popular leader is the Model 70 Winchester, which drew the votes of nearly 12 percent of our hunters. The 70 took a back seat only to the ubiquitous and inexpensive Enfield, which polled better than 18 percent. In show position among specific rifles is the 1903 Springfield with 8½ percent. This percentage will grow in coming months as NRA members buy the recently-available Springfields.

With nearly 40 percent of our deerslayers using one or the other of these three bolt action rifles, their position as favorites is secure. The most popular lever actions (which landed in fourth and fifth places) are the Model 94 Winchester and Model 99 Savage, each of which polled slightly less than 7 percent of the total. Strangely enough, this lever-action popularity is by no means accounted for entirely in the Western states. The Model 99 Savage was the most general in Michigan, where average deer-killing ranges are about 80 yards.

As will be noticed in the popularity graph on page 21, 31 percent of the firearms reported fell into a "miscellaneous" category. This 31 percent includes everything from .22 rim fires to shotguns and pistols. A number of kills were reported with handguns of various calibers and, as might be expected, they were generally long drawn out affairs. One husky buck had to be trailed through endless swampland before it dropped, after taking a full magazine of Luger slugs broadside!

In analyzing this mass of reports, it has been possible to arrive at a fair estimate of bullet and cartridge efficiency. As far as we know, it is the first time enough facts have been brought together to reach any valid conclusions.

The bullet which takes top honors among loads considered suitable for deer is the 150-grain in the .30-'06, which leaves the muzzle at nearly 2,980 feet per second. Of the deer killed with one shot in the heart area, over 60 percent were dropped in their tracks by this combination. This and the other percentages on cartridge performance shown in the graph (WHICH IS THE MOST EFFICIENT CARTRIDGE?) can be compared with the 51 percent dropped in their tracks which is average or "par" with all loads for this anatomical zone.

Cartridge	*Bullet*	*Hit once in Heart Region*	*Dropped in tracks*
.25-35	117 gr.	16	8
.300 Sav.	150 gr.	21	12
.30-40	220 gr.	12	10
.8mm Mauser	170 gr.	8	5
.270	150 gr.	19	6
.257	100 gr.	16	13
.348	200 gr.	13	6
.30-'06	172 gr.	9	6
.7mm Mauser	175 gr.	10	7
12 ga. slug		6	2
.303 Sav.	180 gr.	9	5
.30 Auto.	170 gr.	1	1
.220 Swift	48 gr.	7	5
.300 H & H	180 gr.	5	5
.33 Win.	20 gr.	6	2
.30-30	150 gr.	4	4
.22 H. P.	70 gr.	5	3
.250-300 Sav.	87 gr.	3	1
.351	180 gr.	5	3
.45-70	405 gr.	6	2
.22 Rimfire	40 gr.	1	0
.22 Hornet	45 gr.	3	1
16 ga. slug		3	1
.220 Swift	46 gr.	3	1

Why restrict the comparison to the heart area alone? If you remember the facts brought out by Part I of this survey, the reasoning is obvious. By-and-large, deer were knocked flat if hit in the neck or spine regions, with very little regard for

rifle, caliber, bullet weight or velocity. As an extreme example, the little .22 rim fire dropped over 71 percent of its kills with the first shot. The joker is the fact that only one was killed by a heart hit. Five of the seven kills reported were hit in the neck. Obviously, many a deer was hit in the heart area, the paunch, or the hind quarters with a .22 bullet and was never recovered.

Almost any bullet at any reasonable velocity will kill just as well as the best of our bullets if it lands in the neck or spine. The heart zone, with its relatively low record of efficient kills, offers a far better comparison of cartridge and bullet efficiency.

Owners of .30-30's, who find their pet ranking second in cartridge popularity, will wonder why it fails to show up at all on the cartridge efficiency graph. This cartridge in 170-grain loading dropped only 41.4 percent of its heart-shot deer in its tracks. If included in the graph, it would rank next to last among the favorites, just above the much weaker .250-3000 Savage with the 100-grain bullet.

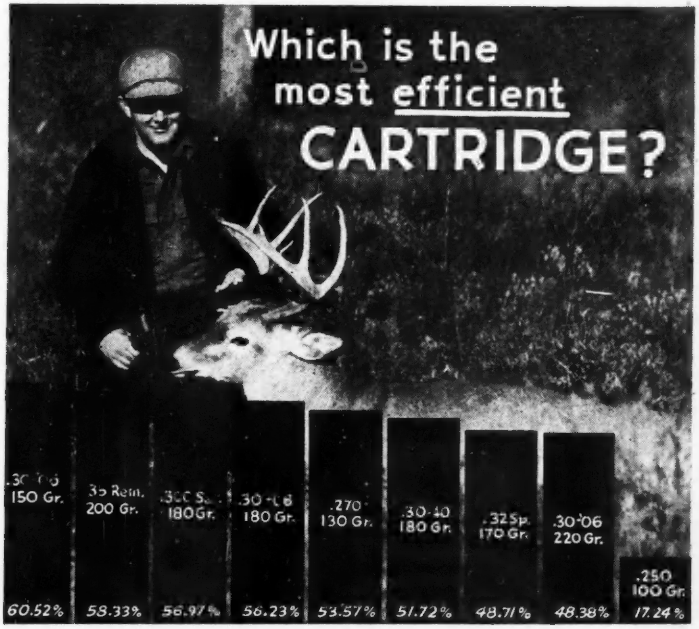
The table on page 22 includes reports on a number of "miscellaneous" loads, with the number of deer killed by a single shot with each cartridge and those dropped in their tracks. It is interesting to note that they vary in efficiency from 100 percent for the .300 Holland & Holland with 180-grain bullet, to zero with the little .22 Long Rifle. These figures should all be taken with a grain of salt. The .300 Magnum turned in an enviable performance with five instantaneous kills out of five heart shots, which is matched by an equal record of effectiveness by the .30-30 with 150-grain bullet. However, in neither case can we consider so small a number of returns as being at all conclusive.

One factor that inevitably affects a survey made in these times of consumer-goods scarcity is that many hunters were not able to use the equipment of their choice. Poor supply and distribution of both ammunition and rifles was evident in many cases. Shooters complained that they were forced to use ammunition not to their liking simply because they could not buy what they wanted. It was evident from the letters that the 150-grain .30-'06 bullet would have polled an even greater return had it been more readily available to the average hunter.

The graph on bullet performance speaks well enough for itself. Here again, the percentage is based on a reaction of heart area, one-shot kills. The interesting point here is that the performance of the majority of our commercial big-game bullets varies so little between one brand name and another. Top performance rating goes to the Open-Point Expanding, with 60 percent of its kills dropped in their tracks with a single shot. With one exception, all of the other commercial bullets turned up records very close to that of this open-point load. Only the hollow-point version of the "Inner-Belted" and "Corelokt" mushroom bullets fell badly out of the running with less than 30 percent of one-shot heart area kills to their credit.

The 55-percent showing of full-jacketed military ammunition is hardly conclusive, since but nine heart-shot returns were credited to such ammunition, of which number over half were pinned to the spot. Nevertheless, even this incomplete estimate of the capabilities of an unaltered, full-jacketed bullet makes one stop and think. This and the close parity of all of our commercial hunting bullets might lead one to think that our highly-developed sporting bullets don't have the advantages over each other which are sometimes claimed for them. Certainly the efficiency of our leading deer cartridges varies far more than do the capabilities of the various commercial bullets which are used in them.

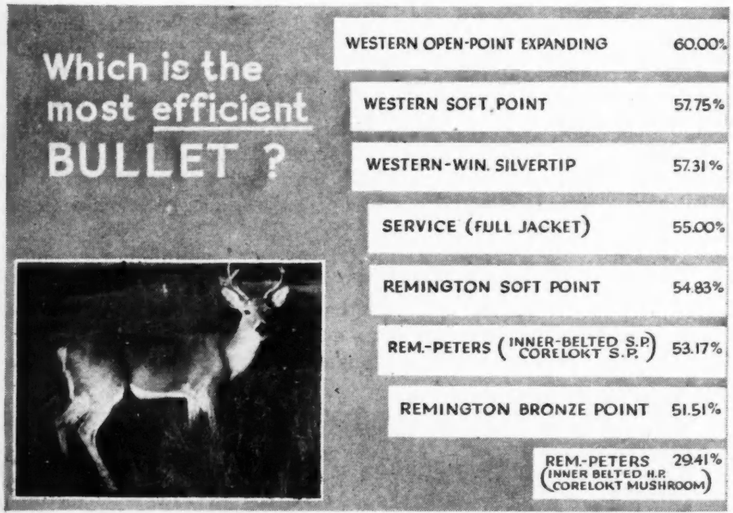
In analyzing the NRA survey, handloaded ammunition presented a difficult problem. With no two alike, they defy every attempt to place them in specific categories. However, for the sake of curiosity, a comparison with the performance of factory-loaded ammunition was attempted. In this instance, the trailing distance on crippled deer was totaled and averaged. In order to reduce distortion, the occasional animal which had to be trailed for 500 yards or more was ignored. Leaving out these few successful instances of trailing an animal for long distances, the 345 reported kills with a single handloaded cartridge dropped their animals an average of twenty-eight and one-half yards from the spot at which they were hit, as compared with eighteen and one-half yards for well over 2,000 single-shot kills with the twelve leading factory loads.



Here are percentages of deer which fell in their tracks from a single heart shot with various popular cartridges. Percentage shown in .30-'06 180-grain column represents over a thousand reports. These nine cartridges were most efficient of all reported

There is one further point which can be brought out in connection with this survey:

In most big-game states there is, or has been, a group whose job it is to decide which cartridges should be prohibited, because of a belief that they are inadequate for deer and larger game. The results have varied amazingly. In some cases regulations in one state are in direct contradiction to those of another locality. The variety of methods used to determine which cartridges are undesirable is almost as great in number as are the states themselves. One state uses 1,200 foot pounds of energy at the muzzle as a minimum. Another uses 1,300 foot pounds, plus a minimum of a .25-caliber bullet diameter and 100-grain bullet weight. Still another uses 1,000 foot pounds remaining energy at 100 yards as its criterion and a 70-grain bullet as the minimum projectile weight. Unique is the use by one state of a one-and-three-quarters inch cartridge length as a minimum. Most big-game states, of course, discriminate against the rim fires.



Here are percentages of deer which fell in their tracks from a single heart shot with each of our most popular commercial bullets. Performance of most bullets was close

The chart on this page combines all available information on prohibited calibers in those states which have such regulations. Also shown are states which allow the use of broadhead arrows for special open seasons when bow and arrow may be used.

Although some criticism may be leveled at the lack of uniformity of these regulations, the end result is bound to be useful. If inadequate, inefficient cartridges and bullets are outlawed, fewer cripples are certain to result. Unfortunately, laws cannot be designed for the few qualified hunters who can be expected to bring home a deer with no equipment other than a single-shot .22 rifle. The fact that there are very few men so qualified should lead a state to revoke its prohibition against such inadequate cartridges. Laws must be shaped to fit the average hunter, who must take every advantage of good equipment in order to make up for his lack of experience as a fulltime hunter and woodsman.

Returning to the subject of specific cartridges, rifles and bullets for the deer hunter, the conclusions reached by the NRA's deer-kill survey are fairly obvious. Primarily, as pointed out in the first of the series, *where* you hit a deer is far more important than *what* you hit it with. Any adequate rifle and bullet is going to bring home the bacon if that bullet can be steered into a vulnerable spot. Contrary to age-old notions, that vulnerable spot takes in the entire neck and spine zones rather than the popular heart area.

Little can be pointed out as far as selection of specific equipment is concerned. If the hunter picks a good bolt-action rifle of .270 or larger caliber, with muzzle velocity of about 3,000 feet per second and a 150- or 180-grain hunting bullet of almost any popular make, he will have an outfit upon which both performance and popularity have placed their stamp of approval.

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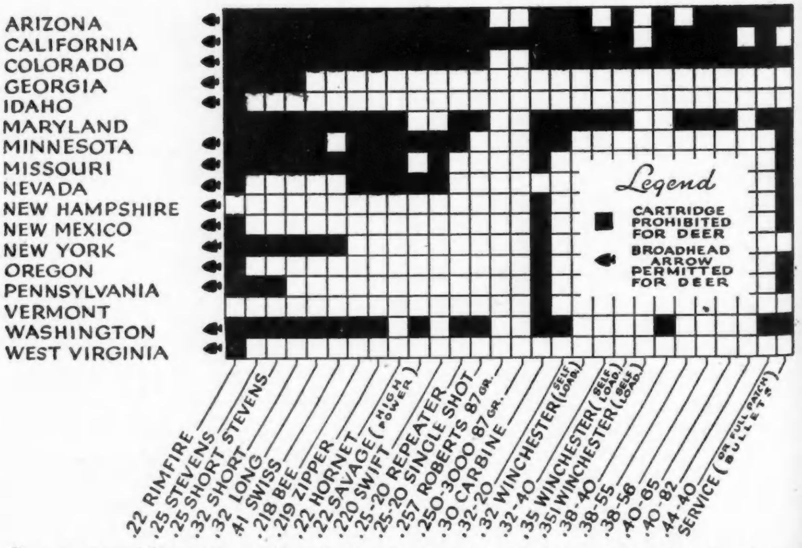
This article completes the NRA's survey of deer kills. Much, however, remains to be done before we can have really conclusive answers to the problems created by the popularity of hunting in postwar America. Chief among these is the matter of conservation—handling our game intelligently, so that an adequate supply may be guaranteed for future years. With Governmental and state aspects of conservation out of the hands of the individual sportsman, it sometimes is a question as to what the lone hunter can do toward guaranteeing that future game supply. As has been pointed out before, the sportsman can do much if he will follow the dictates of humane, sensible hunting, as brought out by such surveys as this, and thus minimize game wastage, *which is the Number One enemy of an abundant game supply for next generation's sportsman.*—Ed.



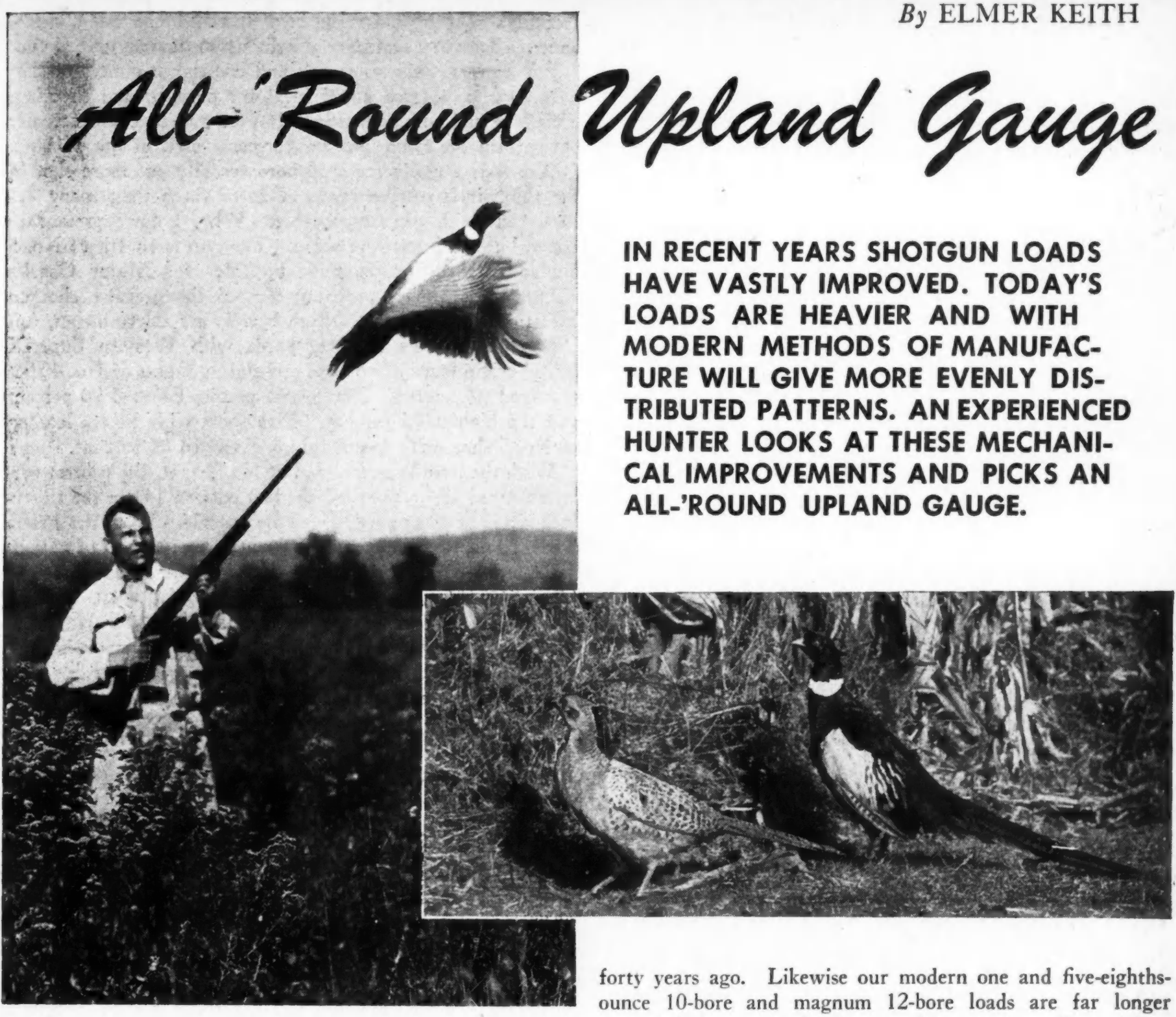
		.22 RIMFIRE	.25 STEVENS	.25 SHORT STEVENS	.32 SHORT	.32 LONG	.41 SWISS	.218 BEE	.219 ZIPPER	.22 HORNET	.22 SAVAGE (HIGH POWER)	.220 SWIFT	.25-20 REPEATER	.25-20 SINGLE SHOT	.257 ROBERTS 87 GR.	.250-3000 87 GR.	.30 CARBINE	.32-20	.32 WINCHESTER (SELF LOAD.)	.32-40	.35 WINCHESTER (SELF LOAD.)	.351 WINCHESTER (SELF LOAD.)	.38-40	.38-55	.38-56	.40-65	.40-82	.44-40	SERVICE (OR FULL PATCH BULLETS)
ARIZONA	◄	■	■	■	■	■	■	■	■	■	■	■	■	■			■	■	■		■		■		■	■	■	■	■
CALIFORNIA	◄	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■		■	
COLORADO	◄	■	■	■	■	■	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■	■
GEORGIA	◄	■	■	■	■																								
IDAHO	◄	■																											
MARYLAND		■	■	■	■	■	■	■	■	■			■	■			■	■	■	■	■			■	■	■		■	■
MINNESOTA	◄	■	■	■	■	■		■	■	■	■	■	■				■	■											■
MISSOURI	◄	■	■	■	■	■	■	■	■	■		■					■												■
NEVADA	◄	■						■	■	■	■	■																	■
NEW HAMPSHIRE	◄																■												■
NEW MEXICO	◄	■															■												■
NEW YORK	◄	■	■	■	■	■	■										■												
OREGON	◄	■															■												■
PENNSYLVANIA	◄	■	■	■													■												■
VERMONT																	■												
WASHINGTON	◄	■	■	■	■	■	■	■	■		■		■	■			■	■					■					■	■
WEST VIRGINIA	◄	■																											

Many states prohibit certain cartridges for deer hunting. Note that some states which have laws against low-power loads allow use during special seasons of broadhead arrow for hunting big game

By ELMER KEITH

All-'Round Upland Gauge

IN RECENT YEARS SHOTGUN LOADS HAVE VASTLY IMPROVED. TODAY'S LOADS ARE HEAVIER AND WITH MODERN METHODS OF MANUFACTURE WILL GIVE MORE EVENLY DISTRIBUTED PATTERNS. AN EXPERIENCED HUNTER LOOKS AT THESE MECHANICAL IMPROVEMENTS AND PICKS AN ALL-'ROUND UPLAND GAUGE.



I CAN STILL REMEMBER when the 10 bore was considered the all-around shotgun for everything. Then the 12 bore took over. It became, and has been for thirty years, the all-around gauge.

Times change; maybe we change also, and certainly we are not as strong and rugged a race as we were forty years ago. The boring of shotguns has not improved much in this time, nor has Fred Kimble's first choke-bored gun been improved on in patterns. However, in the matter of shotgun ammunition, we have made great strides. Companies have improved shotgun ammunition until there is little comparison between the best shot shell of forty years ago and our present fine loads. Despite popular advertising, as near as I can learn, our old Remington Arrow, U. S. Ajax, and Winchester Leader shot shells of the past, actually developed *higher* pressures than our present progressive-powder heavy duck loads.

Today, our standard 12-bore, one and one-quarter-ounce load will out-pattern and outshoot from every possible angle our old one and one-quarter ounce 10-bore load of thirty to forty years ago. Likewise our modern one and five-eighths-ounce 10-bore and magnum 12-bore loads are far longer ranged, far more deadly than anything we formerly used in a 10-bore gun. Today, our 16-bore gun with best heavy loads will usually put more shot in a thirty-inch circle at forty yards than any 12 bore would thirty years ago with the same one and one-eighth-ounce loads. Some may question these statements, but let them do enough pattern work (and it really is work) and they will learn. Formerly the one and one-eighth-ounce charge was standard in the 12 bore, while the 16 had to get along with seven-eighths to one ounce of shot. Then the 16 bore was loaded with one to one and one-eighth ounces. Today our present heavy 16-bore loads are really superior to our old one and one-eighth-ounce 12-bore loads, and our present heavy 12-bore loads will outshoot the old one and one-quarter-ounce 10-bore load; and so it goes.

Just before the last war Remington pioneered with a folded crimp, eliminating that cursed top wad that so often spread the shot charge after it emerged from the muzzle. Western and Winchester and Peters all followed suit. Federal Cartridge Company also developed a frangible top wad that blew to atoms when fired, thus improving their patterns. This one improvement has had a great deal to do with increasing the effectiveness of all modern shot shells. Pattern percentages jumped.

Now all companies are further improving performance by new over-powder wads. Western-Winchester have a new lubricated, oversize wad, in the form of an inverted cup, over the powder. This absolutely seals all gas out of the shot charge. They have further improved this loading by adding a heavy white wad over this lubricated wad. This white wad is made of a highly compressible material with myriads of tiny air cells. It compresses to one-eighth its normal thickness when fired. These soft compressible wads cushion the shot charge when fired and enable it to be pushed through the forcing cone and into the barrel proper with a minimum of shot deformation. Likewise, the present system of lubricated wax-impregnated over-powder wads gives the bore a good lubricating at every shot. As a result the bore of the gun forward of the forcing cone stays clean and often no leading appears at all after a box of shells has been fired. It's a well-known fact that the forcing cone has always deformed more shot than anything else in modern shot shells or guns. Unfortunately, longer, more tapered forcing cones would mean much longer reamers and higher costs of guns. They would also necessitate larger or more readily expanded over-powder wads than we have had in the past, to completely seal off all pushing gas.

ELMER KEITH is known to sportsmen as a writer on hunting rifles and loads and as one of the men who introduced duplex loading to users of modern rifles. He has had a vast amount of experience, both in the employ of the Government and working for himself, in experimental work with firearms. Keith first made his reputation in the gun field as a phenomenal game shot. Keith lives on a ranch at North Fork, Idaho, in the heart of that state's best big-game country.

Today the latest shot shells are so far ahead of our loadings of even ten years ago, as to leave no basis for comparison. While we used to handload shot shells years ago to get the most out of our guns, it is largely a waste of time today. The loading companies will usually beat badly your best efforts in shot-shell loading. With the new loads, patterns that I have run indicate that in many guns percentages are up 10 and often 15 percent over the older loadings. The answer is less shot balling from escaping gas, less shot deformation in the forcing cone and from leaded barrels, and, last but not least, a total absence of an over-shot wad that usually bucked the atmosphere until it was pushed back through the pattern by air resistance.

All of these factors add up to the point that today's 16 bore is a better gun than our old 12 bore, and our old 12 bore with modern loads now beats our old one and one-quarter-ounce 10-bore loads. Our present magnum 10- and 12-bore guns are now passé guns and only needed for difficult long-range shooting. Likewise, our modern standard one and-quarter-ounce 12 bore becomes more of a duck gun than an upland gun.

For a great many years one and one-eighth ounces of shot have been considered about ideal for most upland shooting. This load can now be had in a 16-bore gun that will actually out-pattern the same load we formerly used in the 12 bore. I have seen a really good 16 bore actually put more shot in the thirty-inch pattern circle at forty yards than many 12-bore guns with the same boring. Why, I don't pretend to know, but the facts were there. The gun is an Ithaca No. 5 double with all extras, built to order for Major Charles Askins, Sr., who is probably one of the greatest shotgun ballisticians of our time. Both barrels are thirty inches, full choke. Five shots at forty yards with Western Super-X folded-crimp loads of one and one-eighth ounces of No. 4 shot averaged 92 percent. The lowest pattern counted 90 percent and the highest 95 percent. Five shots with Peters loading of No. 5 shot, with folded crimp, averaged 86 percent.

With the new Western load of No. 4 shot, the poorest pattern showed 134 pellets and the best pattern 141 in the thirty-inch circle at forty yards from the muzzle. With the Peters loads, I failed to center my patterns on three targets of narrow pattern paper so a few pellets were lost on one side of each of these. Still the poorest pattern counted 153 pellets and the best counted 177 pellets of No. 5 shot. Other strings I subsequently ran showed equal performance and proved this was no myth. So we see what can be done with a really good full-choked 16 bore when using loadings which have folded crimp and no top wads. Not many standard 12-bore guns will equal that performance, even with one and one-quarter ounces of shot. A 12-bore gun with one and one-quarter ounces of shot must put around 132 pellets in the thirty-inch circle at forty yards to average 80 percent, and by the same token it should average around 162 pellets of No. 5 shot to give an 80 percent pattern.

When extremely open bores are used for very short range or skeet shooting, then the open-bored 12 with one and one-quarter ounces should have the edge on the best 16 bore ever produced when big patterns are wanted which will maintain a killing density. But when choked guns, from modified to full, are used for more distant shooting, I can see little if any advantage in the 12 bore over the best 16 bores for average upland work. With the best guns and loads, and both the 12 and 16 giving the same pattern percentages, the 12 bore has not over two or at most three yards longer killing range. The 12-bore gun must weigh at least a full pound more than the 16 and, for this reason alone, is probably two or three yards slower in getting on the target than the lighter 16-gauge gun. It may run even more at the end of a hard day when the user has loaded game pockets.

With the 16 bore we can have a gun at least a pound lighter, and ammunition that is not only lighter in weight but considerably less bulky. We can mount the gun, get on our birds faster, and kill them a couple of yards closer to the gun. Also, we can come in at night less tired than if we packed a heavy gun all day.

Looking back over the years, my first fowling piece was a Model 1854 brass-mounted, smoothbore musket made by E. Remington & Sons. I used enormous charges of both shot and powder in that ancient piece and when I did get a side-swipe at a flock of passing fowl within forty yards I usually did pretty well. But at other times single birds flew through my patterns. The old musket kicked like the devil since I used heavy doses of black powder, then a long wad of newspaper, a heavy shot charge, and more newsprint, often tamping both shot and powder before I learned better. Getting tired of having the nipple get wet in a hard rain and having the old Bannerman musket caps misfire, I put in most of an entire school vacation working for the National Biscuit Foundry at Helena, Montana, to earn enough money for a new Ithaca No. 3 16 bore with thirty-inch full-choked barrels and standard stock. I shot that gun for seventeen years, using it on everything from ruffed and blue and sage grouse to sharptails, all kinds of ducks, and the big white Montana jack rabbits. I never could see where any man I hunted with did better with a 12 bore.

Later I used the old Peters Ideal shell with one and one-eighth ounces of shot in that gun and got excellent results on everything but geese. My shot only rattled on the feathers of the geese at seventy yards. Still later I reloaded for it, with three drams of bulk Du Pont and one and one-quarter ounces of No. 5 shot. After finally getting my over-powder wad column the right thickness for the heavier shot charge so I could properly crimp the loads, it did wonderful work on all upland game as well as ducks. Allah only knows what the pressures were, but the gun digested them perfectly and after seventeen years was still as sound and tight as the day Ithaca made it for me. Later when Western brought out their Super-X loads, I obtained a case of them with No. 6 shot, again one and one-eighth ounces. These seemed to perform just as well as my handloads. One fall when hunting out of Durkee, Oregon, I killed seventeen straight Chinese pheasants with that little full-choked 16, without a single miss. Three doubles were included in the seventeen. I have never done as well since with any gun.

At that time I had a chunky 1200-pound jugheaded saddle horse that I used exclusively for hunting. He could swim like a beaver, and walk five miles an hour over any good trail all day long, but he could not run fast enough to catch a sick calf. Nevertheless, he was the best hunting horse I ever owned or broke. He would stand all day if you dropped his reins, and loved to hunt birds as well as I did. We used to climb the slopes of Lookout Mountain after blue grouse. In time I trained him until, at the first roar of rising birds, he would swing his head to the right of their flight, then drop his head and hold still as a mouse while I shot from the saddle. Having spent more of my early life in the saddle than on foot, I seemed to shoot just as well, so long as the birds flew to my left so I could swing with them. Many times I made doubles on the big blue grouse with that old Ithaca 16 from Shorty's back. If I only shot once at a single, or the birds got too far for the second barrel, then Shorty would shiver and tremble slightly while he waited for the second shot. From the way he would prick his ears, I am certain he often smelled the birds before they rose. He carried his tail cocked off to the left habitually and was the last horse anyone would pick for the saddle. His mother was a little Indian cayuse and his dad was either a Percheron or else she was careless, as he was one homely looking judghead. For all that, I wish I had Shorty and similar hunting again; but the horse, those days, and the birds are gone forever.

Before you purchase your upland gun, look well into the merits of the 16 bore. It can be had in any style or design you want, pump or automatic or double. If a single-barrel gun, you can have it fitted with a Poly-Choke or a Cutts or Weaver choke and have any desired degree of choke. Also, with all three you can have a compensator if you wish. Personally I like only double guns and do not like any compensator, for the vents seem to throw the muzzle blast back in my ears and make them ache; so I personally prefer recoil to any and all compensators. If you like a double, you can have one barrel bored more open than the other or both alike. That depends on locality and personal preference.

Use No. 8 shot for quail and No. 7½ for doves. For the larger grouse and ducks I doubt if anything is better in the 16-bore than No. 6, except for long range work on very large fowl when 5's or, if the gun throws them well, even 4's may give some slight advantage out at fifty-five to sixty yards from full-choked guns. From open-bored or quarter-choke guns, it is better to use fine shot as such borings are for close-range work anyway. Get the pattern first, then get it with as heavy a shot as you can.

With modern folded-crimp loads with their new lubricated cushioning over-powder wads, there is no earthly reason why the companies cannot give us one and one-quarter-ounce 16 bore loads. Then we could use the little gun for even difficult long-range work. Recoil would be heavier, but modern guns will handle the load in a two and three-quarter-inch case easily. It is a killing load. I know from experience. ◆ ◆ ◆

Problems With Cast Bullets

(Continued from page 20)

the Bond 280780 H.P. bullet in front of two grains bulk measure of No. 5 and 27 grain of 3031. My son-in-law carried my .250-3000 Model 70 with loads of 22 grains of 4198 behind Bond 257720 H.P. bullets. These two loads were very accurate, gave no leading, and showed a very flat trajectory for cast bullets.

In my .30-'06 Springfield sporter I use 311820 bullets in front of three grains bulk measure of No. 5 powder and 13½ grains of 4227. The load is pleasant to shoot and burns wonderfully clean. To be accurate a load should burn very clean.

Several of the popular cast bullets are not adapted to being sized to groove diameter, as when this is done the surplus metal from wide bands almost completely fills the narrow grease groove and thus the bullet can carry almost no grease. When this sizing takes place in the barrel, the grease is forced out under pressure and where it is needed.

Leading in Two-Land Enfields

I had my doubts as to just how well Enfields with two lands and two grooves could handle cast bullets, so I ordered one to find out. I was lucky and got one with two lands. It was an Eddystone and the tool marks showed up plainly. I used that grand old reliable product "Stazon Rustoff" to polish the bore. This material won't remove tool marks but it does put on a great polish. One hour of good scrubbing was all I gave it. For a bullet I chose Bond 311820 because this bullet has all the bearing surface possible and no extra weight; in other words I consider it the best bullet for such a severe test. Ralph McWilliams, Clinton, Massachusetts, cast these bullets using the usual alloy of tin, antimony, and lead which proved so good in prewar days. I sized this bullet .312 inch and used an over-all length which seated the bullet so firmly in the rifling that often in withdrawing a loaded cartridge, the bullet stayed in the barrel. This is of utmost importance; then the bullet doesn't have to jump into the rifling.

I started with very moderate powder charges: 11 grains of 80; 15 grains of 4227; 17 grains of 4198; 19 grains of 4198; 21 grains of 4198. These loads all proved very satisfactory and gave only a small amount of leading. After each test I cleaned the rifle very carefully, and used one patch of Stazon Rustoff between each two tests. For my sixth test I used 23 grains 4198 and the Bond 311910 bullet, and my seventh was 22 grains of 4198 and the Belding & Mull 311190 bullet.

These last two loads are great favorites in .30-'06 Springfields yet this Enfield handled them O.K. Just the usual trace of lead resulted. Shortage of primers held my tests down to ten cartridges for each different load, and since I had only those sights that came on the rifle I could detect no signs of poor accuracy. The range was forty yards in a sand bank, offhand position, and every shot appeared to go where I called it.

To me it seemed I got less leading the more I shot this rifle. Lead bullets help to polish up new rifle barrels. These ten-shot tests did not warm the barrel any as I shot slowly. I would expect rapid fire with cast bullets in this type of rifle to give plenty of leading. I believe if one follows the above plan on these rifles, results will be all one has a right to expect. ◆◆◆

OLYMPIC FREE-RIFLE TEAM?

The shooting competition in the 1948 Olympic Games which will be held August 2 to August 6, 1948, at Bisley, England, will consist of four events only, two with the rifle and two with the pistol. The rifle events will include a .22 caliber match and a large bore match for any (Free) rifle. The .22 event will be fired prone at 50 meters while the Free rifle match will be fired in three positions, prone, kneeling, and standing, at 300 meters. Three individuals from each nation may enter each event.

There are several reasons why it would seem inadvisable for us to attempt to enter American representatives in these Olympic events. The Free rifle represents the style of shooting which is much practiced in several foreign countries. It is, in fact, the principal type of rifle competition in some European nations which are most interested in marksmanship. However, Free rifle shooting has never had any great popularity in America; there is, in fact, very little shooting of that kind done in this country. Therefore, it would seem impossible to select any shooters for that event who would be truly representative of the best shooting skill of the United States.

The equipment used for Free rifle shooting is highly specialized and guns best suited for this kind of competition are not made in the United States. Prior to 1930, it was the practice of the National Rifle Association to enter a Free rifle team in the annual International Rifle Matches, and also in the Olympic rifle events which were usually combined with those of the International Shooting Union on Olympic years.

It was difficult to find the proper equipment for these Free rifle teams and the shooters felt themselves handicapped by the superiority of the specialized foreign equipment which European teams used. Eventually we found it necessary to import expensive Free rifles from Europe so that our team would have equipment equal to that of European teams.

After the Matches of 1930, we notified the International Shooting Union that the United States would confine its International rifle shooting efforts largely to small bore and service rifle. Fortunately, in the 1930 Matches held at Antwerp, we won the Free Rifle Championship and since that date have not fired in any large bore Free rifle matches abroad.

It is my feeling that, owing to the fact that this is not our style of shooting, we should not attempt to send three men to the Olympics to compete in the Free rifle event. However, the Olympic Rifle Committee desires an expression of opinion from the shooters of America as to whether or not an effort to have shooters from America compete in this Free rifle event should be made.

Milton A. Reckord,
Chairman, Olympic Rifle Committee.

Chronographing Rifle Bullets

PART ONE: Measured Base Lines

By Major Ralph W. French

PROBABLY AT ONE TIME OR ANOTHER every user of a gun has wished to know more regarding the velocity of the bullet fired from it. Chronographing of bullets may be accomplished in any one of several ways. Methods fall into one of the following categories:

1. Measured base line with accurate determination of short intervals of time
2. Methods based on acceleration due to gravity
3. Pendulums, ballistic or torsion
4. Spark photography and sound waves
5. Revolving disc on a common axis

Before considering details of the problem and what is required for their satisfactory solution, it is necessary to decide upon the information really desired. While many gun users have been satisfied with knowing the so-called muzzle velocity of a bullet what they would probably like to know even more is something about its true striking velocity at a range of 100 yards or so. This is really one measure of the bullet's probable efficiency.

This makes it highly desirable to obtain the bullet velocity at two or more points in order that retardation factors may be evaluated. Then the bullet velocity at any point can be determined by simple calculation. This also will make quickly apparent those bullets with the more desirable ballistic characteristics, so that velocities will remain relatively high for some distance from the muzzle of the gun.

As an extreme example of the significance of retardation factors and their effect upon projectiles, the velocities at different distances from the point of origin of fragments of a 4.5-inch high-explosive shell and the M2 150-grain bullet are listed below. The initial velocities of the bullet and the shell were equal, approximately 2800 feet per second.

Feet from origin	*Velocity in feet per second*	
	Shell Fragment	*M2 Bullet*
0	2800	2800
50	1560	2710
100	1360	2645
150	1150	2580
200	1020	2525
300	890	2440
400		2365
500		2300

Many bullets have ballistic characteristics which, when they are launched at 4000 feet per second, retard them rapidly. Thus, the velocity which they have at 500 yards from the muzzle may be less than that of other bullets with an initial velocity of 2700 feet. Adequate chronographing will quickly establish these facts.

To chronograph a bullet with any degree of precision and accuracy, it is desirable to have a setup of at least three, preferably four, velocity screens. In Figure 1, it is shown how such a setup leads to the determination of velocities at several points.

The Aberdeen chronograph, which will be described in greater detail below, is designed to handle three velocity screens. Four screens can only be handled by two such chronographs, or a more elaborate electronic installation. This last is costly.

When the time required for a bullet to pass from screen to screen is determined and the velocity calculated, it results in the determination of the *average* velocity or, theoretically, the velocity at the midpoint between the two screens. In the determination of the so-called muzzle velocity, velocities usually are actually measured some distance, for instance fifty-five feet, in front of the muzzle of the gun. From this, knowing retardation factors, true muzzle velocity may be calculated.

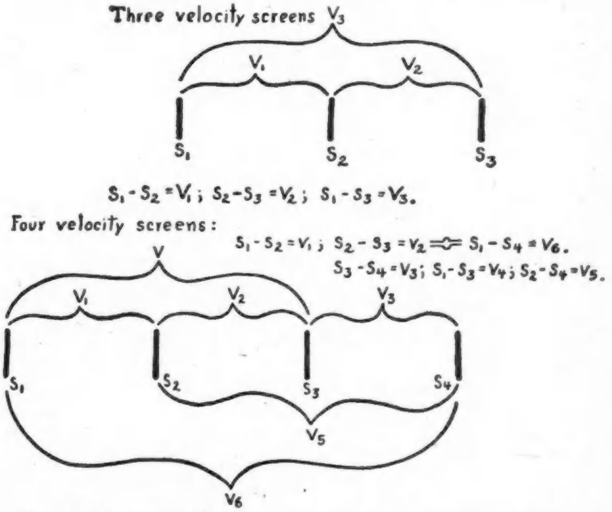

Three velocity screens
V_3
V_1
V_2
S_1
S_2
S_3
$S_1 - S_2 = V_1$; $S_2 - S_3 = V_2$; $S_1 - S_3 = V_3$.
Four velocity screens:
$S_1 - S_2 = V_1$; $S_2 - S_3 = V_2 \Leftrightarrow S_1 - S_4 = V_6$.
$S_3 - S_4 = V_3$; $S_1 - S_3 = V_4$; $S_2 - S_4 = V_5$.
V
V_1
V_2
V_3
S_1
S_2
S_3
S_4
V_5
V_6

Figure 1: Diagrams of velocity screen set-ups indicating how the determination of velocities can be made at a number of points beyond the muzzle

Screens will vary according to the method employed to measure the time interval. Some are electrical, utilizing a make or break circuit. A beam of light impinging on a photo-cell may suffice. A simple conducting ring to detect the electrostatic charge on the bullet may be used. The writer used rings of nickel with a winding of insulated wire some years ago, depending on the inverse magnetostriction effect for results. Screens

For most of his twenty-five years of Army service, Major Ralph W. French has done ballistics research for the Medical and Ordnance Departments. From 1930 to 1935 he conducted the physical-mathematical aspects of a study on gunshot wounds made by a joint-service board under direction of the Secretary of War. Later he was transferred to Frankfort Arsenal where he assisted in the design and construction of the experimental range there. At present he is preparing a study of gunshot wounds in World War II for the Army Medical Department.

should offer minimal resistance to the free flight of the bullet—no obstruction whatever, if possible.

Magnetostriction refers to the fact that some metals and alloys actually change size when magnetized. Iron, nickel, and cobalt all display this property and some of their alloys more so than the pure metals. The inverse effect is that metals showing magnetostriction will, when compressed, stretched, or otherwise stressed, show a corresponding change in their magnetism. This is a quantitative phenomenon and can be employed in the design of pressure gauges and other measuring instruments. However, the effect is a function of time, which must be considered in arriving at absolute values of pressure. Nickel, annealed dead-soft, is a sensitive magnetostriction material and has been used successfully in the construction of sensitive microphones.

Careful base line measurement and positioning of velocity screens is important. Likewise, screens must be fixed in such a manner that exact measurement of the base line can be maintained at all times. Accurate measurement of a base line is more difficult than it sounds. Many tape measures are not accurate. Furthermore, the tape must be used in a certain manner, as specified by the maker with or without support throughout, or at certain intervals, and at a prescribed tension, usually a twenty-pound pull as measured with a spring balance. Also, a 100-foot steel tape may change its length by a half inch when brought from a cool cellar and allowed to accumulate heat in the noon-day sun. For real precision work, one should use a tape made of the nonexpanding alloy called "invar," though very good results are obtainable with a steel tape when it is properly used and when corrections for temperature variations are made.

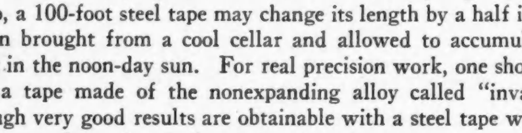


Figure 2: These patterns, drawn or stenciled on paper with electrically-conducting powder or paint, make velocity screens which retard a bullet very little. Pattern at left is used in a break-circuit chronograph; pattern at right in a make-circuit. Either one eliminates the use of metal screens

Suppose you have a twenty-foot base line. For an accuracy of one part in 2000, the screens must be accurately located within 0.12 inch. This precise setting must also be constant, as any deviation will affect velocity calculation correspondingly.

Given the twenty-foot base line, suppose it is desired to accurately chronograph a bullet moving with an average velocity of 5000 feet per second. It will traverse the twenty feet in 0.004 second (400 micro-seconds). Therefore, for an accuracy of one part in 400, the time interval must be determined accurately to the micro-second. This is one-thousandth of a milli-second, yet not so many years ago a device for measuring milli-seconds made the newspaper headlines.

The utilization of modern high-frequency electronic methods permit the precise measurement of time intervals. The latest electronic counters will not only measure the time, but also compute the result and, as it were, post the velocity on the bulletin board. The heart of such a counter is an accurate source of high-frequency oscillations and a device to count the number of oscillations made while the bullet is traveling from screen to screen. This counterchronograph is the ultimate in bullet chronographing. It is expensive, expensive in cost and expensive to operate.

Length of base line may be a question. The longer the base line, the greater the time interval involved and the less the need for reckoning in single micro-seconds or smaller intervals for desired accuracy. On the other hand, the shorter base line can be more accurately measured and maintained, which may more than offset any gain in the longer time interval. Also, a four-screen setup, with a twenty-foot interval, between screens, will cover sixty feet. With the three-screen setup, it is probably better to use a longer interval such as thirty or preferably forty feet between screens.

The over-all length of the velocity range will be controlled largely by the device used for measuring the time intervals as well as by the probable accuracy of the guns and ammunition. Shooting up screens can be annoying as well as costly.

When considering the relative desirability of a "break" versus a "make" in an electrical circuit for accurate timing purposes, first consideration will probably lead to the break-circuit principle as being more positive and more certain in action. Other things being equal, this is a logical conclusion.

However, in practice and when working with sharp-pointed, ogival head bullets, difficulties arise. The nose of the bullet is small and it will seldom squarely hit the wire to be broken. The air wave accompanying the bullet may brush the wire aside so that it is not broken at all, or the wire may be broken by the air wave itself an appreciable time interval after the bullet has gone on its way. Some of the following quoted from a Bureau of Standards' Report on Experimental Firing on the U.S.S. New Mexico in 1918-1919 with fourteen-inch guns well illustrates some of the practical aspects which apply equally to small arms, though on a smaller scale.

"In this case a steel piano wire three-quarters of a millimeter in diameter was stretched tightly across the muzzle. . . . An examination of the records obtained during this part of the U.S.S. New Mexico firing indicated that in most cases no contact had been made between the wire and the shell. . . . The results clearly showed that the wire broke while the nose of the shell was still several feet inside the muzzle of the gun. This was followed by experiments in which bars of various shapes and sizes were placed edgewise across the muzzle. . . . It was found that bars up to and including those with a cross section of one-half by one-eighth inch always broke or were blown loose before the nose of the shell reached them. Bars with a cross section of three-quarters by three-sixteenths inch would sometimes remain until struck by the shell and sometimes not. The velocities determined from the results obtained . . . when contact was made were in almost every case considerably higher than the velocity which was determined as the shell passed through the regular chronograph screens. This indicated that the bars either bent outward or bent to one side so that they touched the ogive of the shell and not the nose, thus decreasing the measured interval of time. Both rectangular bars and bars with cross section to approximate streamline flow were used, but no marked difference was noted in the results. A few bars one by three-sixteenths were tried out and seemed to give more consistent results, although the number tried was not sufficient to make the results conclusive." (Further study supported this type of bar which was finally employed in the definitive work.)

The muzzle blast with small arms is just as much of a problem as it is with big guns. Any delay in making or breaking a circuit will prevent accurate chronographing, while variations in the delays will lead to large indeterminate errors. With the rifle bullet the problem is to use a material which will least interfere with the flight of the bullet and yet will be broken only by the bullet itself. The first requires a friable, brittle material which is easily snapped, while the last requirement, if a wire is anywhere near the muzzle of the gun, makes a tough material requisite. This raises a dilemma for which there is no very satisfactory solution when using screens too close to the muzzle of the gun.

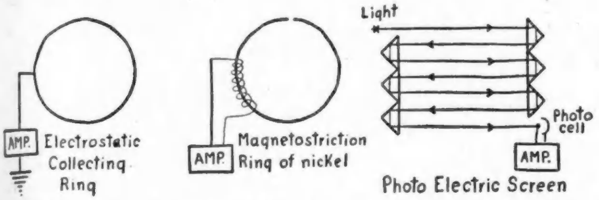

Light
Photo cell
AMP.
Electrostatic Collecting Ring
AMP.
Magnetostriction Ring of nickel
AMP.
Photo Electric Screen

Figure 3: Schematic principles of three types of electronic velocity screens used in chronographs. None of those will interfere with a bullet in its flight

From this it is readily seen that for accuracy, the type of screen is important. For many years the Boulengé chronograph operating on a break-circuit principle was used with a fine wire at the muzzle of the gun, on the supposition that the bullet broke the wire. For the terminal break in the circuit what was known as a disjunctor was commonly employed. Investigation at Frankford Arsenal proved both to be faulty. The disjunctor, depending on a rolling ball to break the circuit, was often slow in functioning. In this investigation an effective and positive break-circuit screen was devised by using one by two-inch silvered micro-cover glasses as velocity screens. The bullet shattered these promptly, thereby positively breaking the electrical circuit. This, however, requires consistently accurate shooting.

Another quite positive make- or break-circuit screen of slight retarding value may be devised by printing or stenciling a suitable pattern on paper (Figure 2) and making it electrically conductive with metallic powder. With a little care in design either of these screens can be very dependable and simple to use. In the case of the break-circuit screen the holder completes the circuit through the screen at the top and bottom; in the make-circuit screen holder is at the sides.

Various metal-foil screens have also been used with some success for make-circuit purposes, such as required with the Aberdeen chronograph. Lead foil 0.002 inch thick is probably the most dependable, though brass foils may be quite satisfactory. Aluminum foil is unsatisfactory, as it is so light in weight that it rolls away from the bullet and often fails to make a positive electrical contact. In foil screens with air separation, actual contact is frequently made by the foil rather than the bullet and may occur an appreciable time interval after the bullet has passed through the screen. Foil screens are often quite undependable and many shots will fail to close the circuit. They usually offer an appreciable retarding factor also.

With electronic methods it becomes practical to use screens which do not retard the bullet. A simple collecting ring electrically insulated from the ground will suffice to pick up the electrostatic charge on the bullet. The magnestostriction effect or the photo-electric cell also may be used. These devices are shown schematically in Figure 3.

Condenser Charge

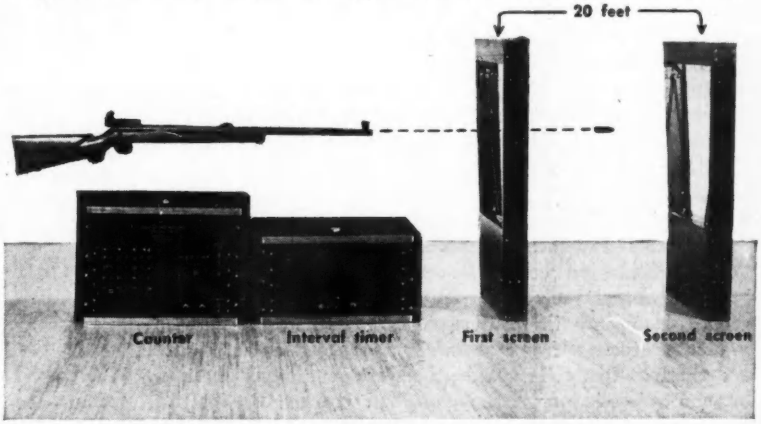
Short intervals of time may be measured with a fair degree of accuracy by other than expensive electronic methods. The fact that a known voltage will charge a condenser with a certain quantity of electricity in a given interval of time, permits measuring time intervals when other quantities are known. Some care is required in the practical application of this principle if a high degree of accuracy is desired, for condensers often display vagaries which proscribe consistent performance.

In using condenser circuits the ballistic galvanometer is usually the instrument of choice in the measurement of condenser charges. Galvanometers are sensitive instruments for detecting or measuring relatively feeble electrical currents by their magnetic effects. Fundamentally there are two types of galvanometers, the suspended-needle and the suspended-coil type. The latter is more commonly used, especially for ballistic or quantity measurements.

The word "ballistic" derives from a Greek word signifying "to throw." The ballistic galvanometer is designed so that the moving coil is rather slow in starting to move, due to a high moment of inertia, but when it moves it does so in response to the total quantity of electricity which has passed through the coil. The maximum throw or movement of the coil is proportional to the quantity of electricity which passed through it.

In practice a small mirror is usually mounted on the moving coil and the maximum throw read by means of a beam of light reflected from the mirror to a graduated scale.

M. G. Schorr of the Yale University Medical School developed a practical application of this principle after a circuit



Basic devices needed to measure the velocity of a rifle bullet with a time-interval chronograph. This is the National Rifle Association's Potter chronograph, used for Technical Division tests

patented by the Western Cartridge Company. This was used in some research work at Yale University during World War II with high-velocity missiles, a short base line, and a probable error not exceeding one-half to one percent obtained after making allowances for dielectric absorption in the condenser. It is estimated that an accurate assembly can be made for $150 or a little less.

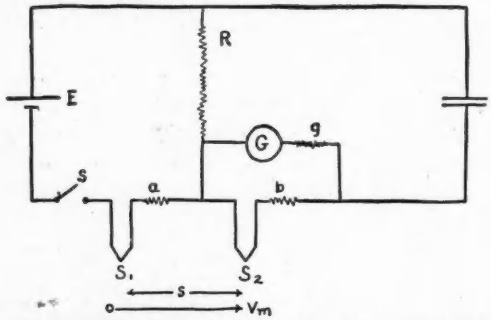


Figure 4: Diagram of chronograph circuit which determines bullet velocity by measuring the condenser discharge with a ballistic galvanometer

The circuit is given in Figure 4. It consists of a source of potential E, switch S, resistance R, condenser C, ballistic galvanometer G with its associated coil resistance g, and the continuous paper or wire break-circuit screens S_1 and S_2 with their respective internal resistance a and b. The screens are shot through from S_1 to S_2 by a projectile moving with a mean velocity between S_1 and S_2 of v_m. The distance between the velocity screens, s, is measured in feet.

The circuit operates as follows:

1. With the screens and switch closed, the condenser **C** charges to the potential appearing across resistance R.
2. Screen S_1 is broken by the projectile, thereby removing the driving potential and the condenser commences discharging through resistance R in series with g and b in parallel.
3. After a time equal to s/v_m, screen S_2 is broken and the condenser completes its discharge through R and g in series. It is evident that if b is very small with respect to g in 2 above the charge will pass through the shunt b and will not affect the galvanometer until S_2 is broken. The galvanometer deflection due to this remaining charge becomes an indication of the time between S_1 and S_2.

From the laws of condenser discharge through a ballistic galvanometer, it is found that

$t = 2.3\ rC \log_{10} \phi_o/\phi_c$

where $t =$ time for projectile to move from S_1 to S_2

$r =$ total discharge path resistance $= R + bg/b + g$

$C =$ total capacitance

$\phi_o =$ deflection corresponding to the initial charge on the condenser, obtained by opening screen S_2 and noting deflection when S is opened

$\phi_c =$ deflection obtained by shooting

Since $v_m = s/t$

where $s =$ distance from S_1 to S_2 in feet

we find that

$$v = \frac{s}{2.3\ rC \log_{10} \phi_o/\phi_c}$$

Other condenser timers can be devised, but most will be more expensive and less accurate than this arrangement. Electronic tubes and meters can be used, but an accurate meter with a scale length sufficient for reasonable accuracy will cost more than this entire assembly. This circuit also should not suffer seriously due to current leakage which will plague many condensor assemblies. However, a condenser of good quality, preferably with mica dielectric, should be used. *(To be concluded.)*

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Aim Well and Fire Accurately

It is of the first importance that the soldier should be instructed to aim well and fire accurately, and to ensure proficiency in this, the following rules will be rigidly enforced by commanding and inspecting officers.

Several targets will be provided for each regiment when embodied, and one for each company when detached on command for any considerable time of the following description: Five feet ten inches high by twenty-two inches in breadth, and painted white; it will be marked by three black stripes drawn horizontally across one at the top, the second at the middle, and a third equidistant from the first and second; the center stripe having in its center a bullseye, eight inches in diameter, surrounded at two inches distance, by a circle one-inch broad.

The practice will commence at the distance of fifty yards, by which means the soldier, seldom missing his object, will acquire confidence in greater ranges. The soldier will be gradually removed from the target to the distance of eighty and finally to that of 140 yards, about the point-blank distance, or point of second intersection of the ball with the line of sight, by which time the soldier will have gained such a knowledge of his musket, as will enable him to fire, with considerable accuracy at a target placed at its extreme range by observing the rules laid down for aiming at an object brought within the point-blank distance.

Assuming as the point-blank range of a musket, about 140 yards, in proportion as the soldier approaches the target placed at this distance he slightly depresses the muzzle below the object aimed at; for example, to strike the bullseye, he should point slightly below it; if farther removed than the point blank he proportionately elevates.

The men must be instructed, in aiming, to hold the butt firm against the right shoulder, to support the firelock steadily with the left hand, and to bring the breech, the sight, and object, to coincide with the visual ray.

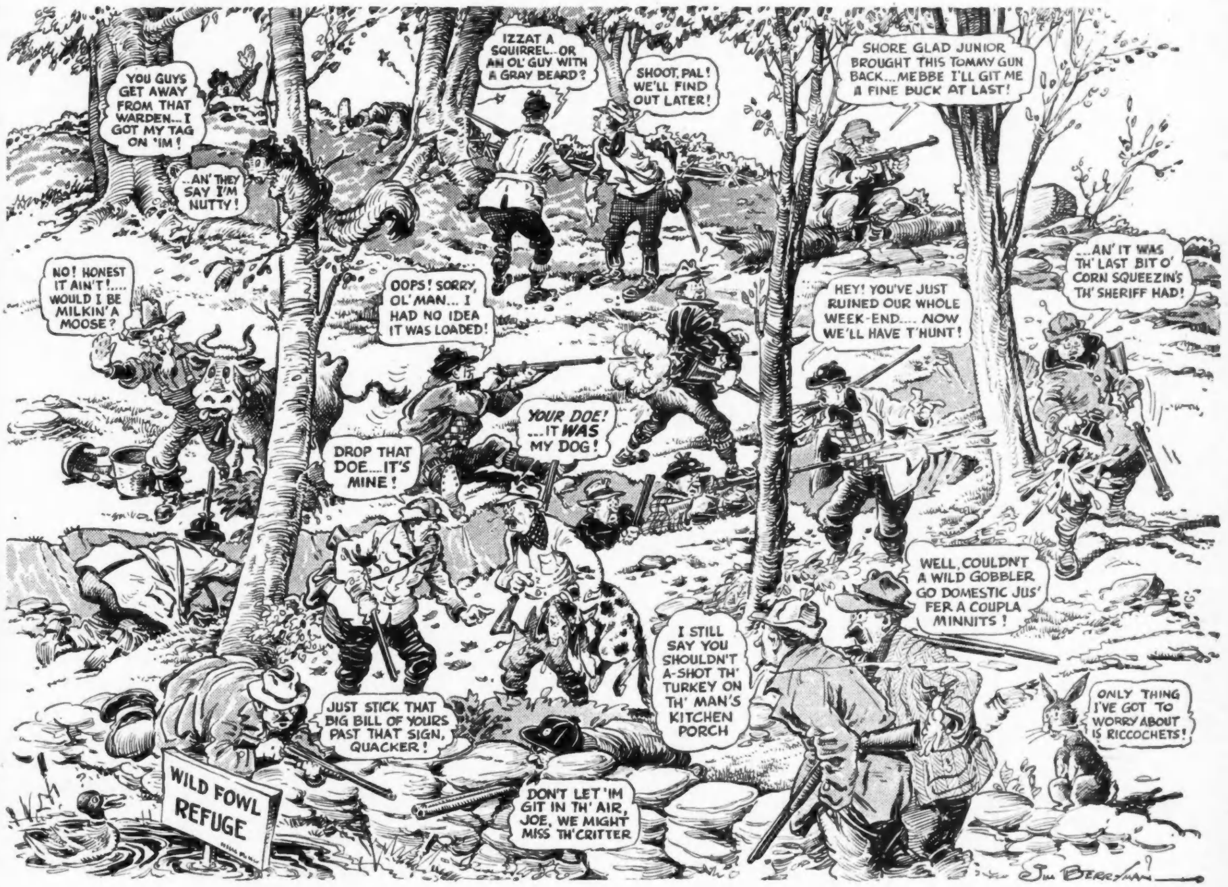
The men must be instructed to pull the trigger forcibly, at the word FIRE, without stirring the head or altering the direction of the firelock.

All the soldiers, including musicians, shall practice target firing.

—Infantry Tactics, published by the Department of War, 1830.

FIELD SPORTSMANSHIP

By PIERRE PULLING


YOU GUYS GET AWAY FROM THAT WARDEN... I GOT MY TAG ON 'IM!
...AN' THEY SAY I'M NUTTY!
IZZAT A SQUIRREL...OR AN OL' GUY WITH A GRAY BEARD?
SHOOT, PAL! WE'LL FIND OUT LATER!
SHORE GLAD JUNIOR BROUGHT THIS TOMMY GUN BACK... MEBBE I'LL GIT ME A FINE BUCK AT LAST!
NO! HONEST IT AIN'T!.... WOULD I BE MILKIN' A MOOSE?
OOPS! SORRY, OL' MAN... I HAD NO IDEA IT WAS LOADED!
HEY! YOU'VE JUST RUINED OUR WHOLE WEEK-END.... NOW WE'LL HAVE T'HUNT!
...AN' IT WAS TH' LAST BIT O' CORN SQUEEZIN'S TH' SHERIFF HAD!
YOUR DOE! ...IT WAS MY DOG!
DROP THAT DOE....IT'S MINE!
WELL, COULDN'T A WILD GOBBLER GO DOMESTIC JUS' FER A COUPLA MINNITS!
I STILL SAY YOU SHOULDN'T A-SHOT TH' TURKEY ON TH' MAN'S KITCHEN PORCH
JUST STICK THAT BIG BILL OF YOURS PAST THAT SIGN, QUACKER!
ONLY THING I'VE GOT TO WORRY ABOUT IS RICCOCHETS!
DON'T LET 'IM GIT IN TH' AIR, JOE, WE MIGHT MISS TH' CRITTER
WILD FOWL REFUGE

GOOD MANNERS, you might say, can be anything from a pleasant smile on a Monday morning to properly rear-marching a dowager from the Court of St. James. It all boils down to giving consideration to the other fellow. And good sportsmanship is just ordinary good manners applied to sport!

Many of us who are primarily hunters have felt that there are chips being knocked off our shoulders, what with so much bitter criticism being tossed around regarding our behavior in woods and fields—the sharpest coming from target shooters who are trained in the rules of the range and who have learned *safe* conventions everywhere. Perhaps the criticism has been strong but, looking at it impartially, that's the way it should be if it is justified. And, since much of it probably is justified, we can only hope that American shooters are more amenable to sportsmanship training than are American motorists to good road manners. There is some hope—after all, European drivers are as wild as Americans, but European hunters are polite.

At the risk of appearing to be contradictory, let's be clear that this is no diatribe on turning the other cheek and other such pious virtues. We are in an age of competition and the experienced hunter with proper equipment rates a heavy game bag just as the trained target shot with a good rifle deserves high scores. We shoot to kill and play to win, but there is no reason nowadays for the old-fashioned meat hunter. Yes, it's nice to cut down the grocery bill, but if we can afford to hunt, most of us can afford to buy food—even at today's prices. There have been times when I couldn't and I had to quit cold.

Assuming, then, that meat-getting is of secondary importance to the sport itself, it follows that today's hunter is not a real sportsman unless he can see himself in the place of the other fellow, who also rates a fair chance, and in the place of the game, which is playing for its life and rates either a clean kill or escape. I try to bear in mind that the other fellow may not have my forty years' experience or my tried and

GOOD MANNERS AMONG COMPETITIVE SHOOTERS MAKE RANGES SAFE. IS IT A LACK OF THOSE MANNERS AMONG HUNTERS THAT CAUSES MOST "ACCIDENTS"?

trusted equipment, but he has to start sometime.

During a white-tail hunt in Superior National Forest, there were eight in our party—several old-timers with good rifles and others who were pretty green. Two, in fact, were clerks on their first hunt who had borrowed guns. But they had practiced shooting and were fair marksmen.

A buck was shot at sunrise and another during the forenoon. After lunch, we were getting dispersed for a drive when someone jumped a big doe in an open burn between one of those clerks and an experienced hunter. Since it was legal to shoot any deer, buck or doe, larger than a fawn, they each got off some shots and the deer went down. I was close by and drifted over to see the meat. Lacking a real argument, each hunter thought it was his deer. Claimed it anyway! There was one bullet hole and the angle was clear. The type of bullet was such that little deflection was probable so I traced its course carefully as the doe was gutted. The locations of the shooters were definite so I reached my own conclusions. The clerk, sensing that, and realizing that I was the most experienced hunter in the party, wangled me out of earshot while we studied his shooting position. "Pierre," he asked. "Who hit that doe?"

"You know who hit it," I replied. "You did."

"Sure I know," he came back. "But John says it's his."

"OK," I said. "Tell him it's his. Don't argue about a piece of meat when you're not hungry."

It is pleasant to report that the little clerk got a fine buck the next day. The older man who claimed the doe needed disciplining, and he got it. No one said anything, but he knew what his friends were thinking. It may not have done him any good since he was past forty and set in his ways. But we can always hope like the English schoolmaster who replied, when asked the proper age to start disciplining a boy: "Oh! You must at least begin with his grandsire." Anyway, the clerk got a lesson in sportsmanship, and he had practice in killing two deer.

While doing some undercover checking on the boundary of a big duck refuge, I met a couple of hunters. One had his limit; the other was a bird short. The second man pointed into the closed area. "I dropped a big mallard over there," he said. "But I don't dare go git him."

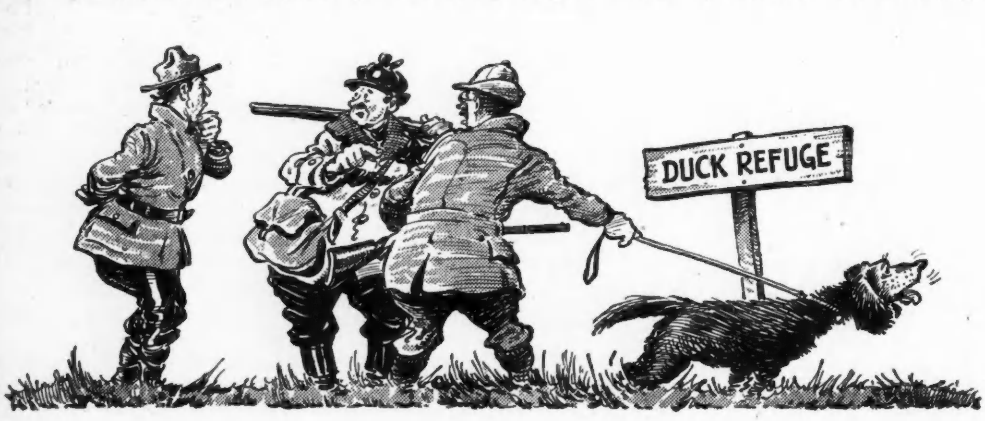
I began to paddle across the boundary slough ("slew" is the way we say it!), saying I would be retriever. The hunter solemnly said, "You stay outa there or one of them damned wardens will git you."

I explained that it was legal to go into a refuge to get a dead bird if you left your gun outside. Or you could send your dog in since he is not supposed to be able to read signs the way a duck can! So I picked up the green-head and everyone was happy. Those hunters were good sportsmen, but they had been misled by some wardens who were not.

Harsh action seemed necessary while on a Montana muley hunt. Our party was dropping some meat, but we were by no means filled up when we ran across a dressed but untagged fork horn buck. (The law demands immediate tagging everywhere so far as I know.) We never identified the hunter who shot this fine little buck, but we did talk to a member of his party and found that he had cached the deer in hopes of getting a bigger one. Figuring that once others knew about it, the hunter would never reclaim it, I suggested to one of my party that he tag the deer and take it to camp. If there is a question about my own sportsmanship, there is none about that of the fellow who left the buck untagged. The time to decide whether or not you want a certain head of game is before you pull the trigger. Yes, there are alibis—you could forget your tag. You could forget your rifle, too!

Worst of all examples of poor sportsmanship, of course, are those which cause or lead to accidents—although "accidents" is a misnomer in most cases of injury or death. Some hunters go wild, but a good sportsman will not hunt if he knows he is incapable of hunting safely. There are people who are unfit physically or mentally to handle guns just as they are unfit to drive a car, paddle a canoe, ride a horse, or do anything that will test their judgment and stability. Unbelievable things happen, as in a Wisconsin "accident" I checked recently. Two brothers—big boys of eighteen or so—tracked down a bear into a small swamp in the midst of an old burn. One of the boys worked through the swamp; the other circled it. The boy in the swamp climbed a leaning tree for a possible view of the skulking bear, and his brother shot him out of the tree. Moreover, while he was struggling around on the ground, the brother shot him again, killed him, and then became utterly incoherent. Maybe a psychoanalyst could figure it out. We could not.

Bear hunters seem especially wild. A young hunter, a member of a party, went out at dawn in New Brunswick and spotted another hunter, in a red sweater, sitting on a rock in an open glade. "There's a bear!" said the boy, and he threw up his rifle. One of his companions thought he was trying for a bad joke; another must have seen danger as he made for the shooter, calling: "It's a man!" But before he could strike up the rifle, it went off and the sitting hunter was shot dead.



Also in New Brunswick, 'way back about 1923, I checked two cases of horses being shot for moose. Only bulls were legitimate game, and they had to have at least three points on each antler. One hunter shot a bay horse in harness on a road with two boys driving it. He dashed out for the meat, admitted his guilt, and bought another horse! Another shot a gray horse attached to a potato digger in absolutely open ground. He too rushed out of the woods and, when asked what he mistook for horns, indicated the tall, brass, nobbed hames that stuck up above the collar!

When my son was a high school student, we were hunting on a Mississippi River slough. The ducks were not moving, so we rooted out mallards and jump-shot them from the canoe. The youngster was manning the bowgun while I handled a duckbill pole. The game was not piling up very fast, even though young Bart was deadly enough on those close-lying jumpers.

There were a couple of hunters above us with some block decoys in an open spot. They had fired a few shots and we heard them talking to a dog. Presently we saw a dog—a big red cocker. He was fifty yards off our port bow. Then Bart saw his quarry: A fine green-head mallard had been wing-tipped, and was squatting in the reeds. Bart put a skeet charge in the right barrel and killed the duck with the dragging shot, the bag being so light that drake looked good to him. The cocker, however, had been chasing that duck for half an hour, although he never would have caught it in the heavy vegetation and was about done in. We picked up the dog, poled to the open spot, dumped dog and duck over the side, and called to the hunters that there was their pup and their bird. They shouted their thanks and that was that. I never saw the hunters although they saw us clearly from their blind. But I remembered the dog.

A couple of years later we were again hunting in that vicinity. The kid was a "college man" by then and we were having lunch in a little Wisconsin village when I spotted that cocker! "You know, I believe I know that dog," I said to his master. "Yeah," he replied with a broad grin. "And he knows you. You found a big green-head for him two years ago, up in the Alma Pool. And we appreciated it."

Perhaps the son did not exactly know whither we were drifting when we turned in that duck, but he found out. Perhaps he and other young bucks who are now Life Members of the NRA will keep up the battle for hunting courtesy. There may be no real rules. Sportsmanship is a state of mind. But I will list some of the things I try to do and what I suggest to young folks and to hardened sinners alike.

1. Try hard to be a good hunter and as good a shot as physical limitations permit.
2. When you acquire hunting tools, get guns and ammunition that will kill the game you are after. Yes, you *can kill* deer *and moose* with a .22 long rifle, but we are discussing sportsmanship.
3. Always think about the courtesies you would hope for from the other hunter and extend them to him. Admittedly, there is a limit, but go three-quarters of the way.
4. Go more than three-quarters of the way in being a sporting hunter when you must compete with young people, women, or inexperienced hunters. But try to teach them.
5. Admitting it's frequently impossible, try to hunt clear away from everyone else, and respect the other hunter who is trying to do the same thing.
6. Try to kill your big game with one bullet and never shoot at a bird that is out of range.

A dozen other field amenities are at my finger tips, but if you absorb these, the others are obvious. Preaching may be useless. Only actions count. I felt like writing this twenty years ago, but it seemed silly. Perhaps it *is* so silly that few will read and fewer heed. I may be like the querulous clergyman who censures the faithful in his congregation because others are absent. *If* you follow these preachments, however, your hunting companions will respect you.

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Match Conditioning: Mental

(Continued from page 14)

off wrong because liquor or drugs were the only means they, or the coach, knew of obtaining the mental attitude that would produce winning or high scores. The right answer is to train your men in such a manner that they have the self-control needed to produce high scores without artificial aids.

While the mental attitude attained by drugs or liquor may be all that is desired for high scores, there are certain disadvantages to go with the use of these crutches. It is a well-known fact that liquor makes you feel sharper than you really are. All the while, though, coordination is falling off, eyesight is becoming more blurred (harder to focus), and a slight body weave is noticed. With the barbiturate drugs sometimes used by shooters, a decline in muscular-nervous co-ordination is noted.

Aside from mechanical competence, which is presumed for the purpose of this article, my program is (1) mental conditioning, (2) concentration, and (3) competition.

To repeat, mental training of shooters should start with their first lessons. It should teach them that shooting is a mechanical function controlled entirely by the mind. If we train the mind to perform its function properly through concentration and the development and maintenance of a "shooter's mind," we will be able to shoot match scores as good or better than practice ones.

Lastly, if we are serious about the game, competition should be engaged in at every opportunity. This is the acid test. If we can take matches in our stride and shoot our everyday scores, we have arrived.

These, I hope, are only the first limping steps into a new field of shooting development. I hope they will not be the last. What are your ideas, fella?

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Chasing Rainbows

(Continued from page 11)

The final outcome was successive groups as follows fired on three different days: At 100 yards the first ten-shot group (using a six-pound trigger pull) was exactly one-half inch, center to center. The load was the prewar 50 grain 8-S bullet and 28.0 grains of No. 3031 powder in Remington cases. The next five shots on another day went into .48 inch. The last five of the original twenty went into five-eighths inch at 100 yards and with one badly called shot.

Judging from such experiences, who can claim that he has developed the most accurate cartridge? I will always be skeptical of such claims. Too much depends on too many different items.

Even if the reloader and shooter does everything to perfection, the finest accuracy is still an unknown quantity. For instance, on a hot summer day we tried an accurate load in an Improved .220 Swift rifle. After that we followed with loads that had been placed in an ice chest. The impact at 200 yards with the cold loads was fully three inches lower than the group made with loads at normal temperature. Just imagine what effect all of these changes will have on our shooting! Then, too, we are prone to shoot too fast with high-intensity cartridges, so that the barrel heats up rapidly, thus causing not only a change in zero but increased group size. I happen to know that all my personal rifles will consistently give many more small five-shot groups than is possible for ten consecutive shots, unless there is a deliberate delay between shots. The last shooting experience with less than minute-of-angle accuracy should verify this statement. I could, upon request, produce many 200-yard five-shot groups under one and one-half inches.

I have kept in mind many of the suggestions by old timers on their bench-rest shooting, although I admit that I have never gone all out to really determine just what the best accuracy is with a given cartridge.

I did have a Gebby-relined Sharps-Borchardt in 2-R Lovell caliber which when new showed only average accuracy. After rebedding the barrel as described in the February, 1942, issue of THE RIFLEMAN, I could bet any time, and win under normal conditions, that this one rifle would group in three-quarters inch or less at 100 yards using the 50-grain 8-S bullet and a case sifted full (not weighed) of No. 4198 powder. My first experience with this rifle would not prove anything about the accuracy of the 2-R cartridge.

I have had other rifles and cartridges which have been outstanding. For example, a .22-250 Bull Pup was so accurate, *with a cold barrel* at least, that the original barrel was removed and replaced when a 200-yard five-shot group with selected handloads "opened up" to 2.20 inches! The smallest group on that day was 1.60 inches at 200 yards. With that kind of accuracy after more than 2,500 rounds and with reasonable care in reloading, I am sure we have an excellent chance of competing with some of the old-time bench-rest shooters.

What we must keep in mind is that all groups are not fired in one day and that the smallest groups are made only on the most perfect days, considering wind and mirage. And the rifle must be perfectly bedded, among other things. Just remember that the dean of bench-rest shooting, C. W. Rowland, had only three favorite rifles of more than fifty which he owned at one time or another. It would be safe to say that Rowland spent a lifetime learning to get the utmost out of those three rifles. What then, after his experience, can we do to prove that our cartridges are more accurate?

Many times so much depends on the rifle, and not the cartridge, that we are defied to name the *one* superb caliber. Should I have to make a personal prediction on which of our present-day cartridges will compete with and possibly give even smaller groups than those already on record, the selection would be one of the high-velocity .22 calibers. Possibly as many small groups have been made with the various .22 center-fire rifles as can be credited to many of the older low-velocity cartridges.

My selection, based on actual shooting experiences and many authentic reports, would include such cartridges as the .219 Donaldson-Wasp, the .22 Gebby-Varminter, Improved .219 Zipper, my own .22-30 (based on the shortened .220 Swift) and the so-called "Improved .220 Swift." So many good groups have been made with these calibers as to make them likely prospects. We should also include the 2-R Lovell and .220 Wilson Arrow.

This list does not include any commercial cartridge, but there is a good reason. Only one . . . possibly the .220 Swift in good rifles . . . will come close to duplicating the many outstanding performances of the best wildcat cartridges. One reason why some of the wildcats give such fine results is that invariably anyone interested enough to own an odd caliber is at heart an experimenter. He will try every possible load and bullet combination to obtain the best accuracy.

That kind of testing and experimenting brings us right back to the requirements learned years ago by other shooters who wanted the best that a cartridge could give. That requirement is still endless patience and skill in loading and handling a rifle. When we take the same care in making our loads as some of the Schuetzen shooters did, I believe we can duplicate the results obtained years ago with cartridges of much lower velocity. But we cannot duplicate the Rowland groups, for instance, until we are willing to duplicate the care and skill that went into their making.

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SALE OF RIFLES SUSPENDED BY DCM

Because of the large number of orders for Springfield rifles received by the Director of Civilian Marksmanship, that office will temporarily suspend sales after December 31. All orders received after that date will be returned. Sales are not being discontinued, merely suspended for a short time to allow the DCM to fill orders received by that date, an estimated 70,000.

An announcement will be made in THE AMERICAN RIFLEMAN when the DCM will again accept orders for rifles. *(See notice on page 50.)*

Making A Gunstock

PART TWO: INLETTING

By O. V. STEPHENS, JR.

INLETTING THE STOCK BLANK to form the recesses for the metal parts of the rifle does not require a high degree of woodworking skill. Time, patience, and a knowledge of the use of common hand tools will suffice. But accuracy in marking off on the blank the areas to be inletted and care in working to close tolerances when removing the wood from those areas will pay off in a neat job.

Dimensions of the parts to be inletted are taken directly from the barrel and action. After they are laid off on the blank, they should be checked for accuracy. The one-quarter inch width of extra wood along the bottom of the blank allows only minor mistakes to be corrected by inletting the parts deeper and planing off the extra wood.

The tools required are few: Chisels, both straight and half-round cutting edges, a pocketknife, a scorer, a try square, and a workbench. An elaborate workshop is not needed, but the workbench is essential. The jaws of the vise should be padded with soft wood or leather so they will not scar the blank. All cutting tools should be razor-sharp.

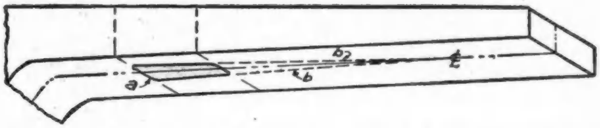
The Guard Assembly—A perfect junction of the magazine box and the receiver in the finished stock depends upon the precision of the guard assembly inletting. Establishing the magazine box outline on the bottom of the blank is the first step. If the blank's top and bottom were parallel, the length of the magazine box could be laid off directly on the bottom of the blank. But the bottom of the blank slants up, and the top of the magazine box must be parallel with the blank's top, so an indirect method is used.

The stock pattern is correctly positioned on the side of the blank, and the front end of the magazine box is marked with a pencil at the top of the blank. An eight-inch try square is squared with the blank's right side, and a line is drawn across the top of the blank from the marked point. This line is extended down the right side, the try square being squared with the blank's top. The try square is then squared with the right side again, and the line is extended across the bottom of the blank. The length of the magazine box is measured and laid off along the top center line to the rear of the magazine box front line. A line is drawn through the end of this dimension across the blank's top and extended down the right side and across the bottom of the blank. The try square is squared the same way as it was for drawing the front line. These two lines show the magazine box's true length on the top, right side, and bottom of the blank.

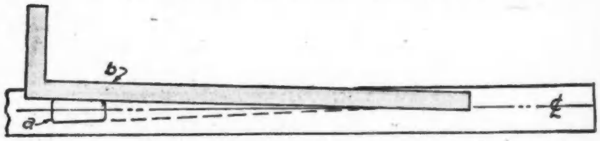
The magazine box is narrower at the front end than at the rear end, and its corners are rounded. Its width is laid off directly on the bottom of the blank. The front width of the bottom of the magazine box is measured where the sides begin to round. This dimension is divided in half with a pair of six-inch dividers. One point of the dividers is placed on the intersection of the center line and the magazine box front line on the bottom of the blank. A half-width dimension is laid off on each side of the center line with the other point of the dividers. The same procedure is used to lay off the rear width of the magazine box.

A long, straight-edged ruler is next aligned with the front and rear points which were established by the dividers on the left side of the center line. A line is drawn with a sharp-pointed, hard pencil between the two points and extended until it crosses the center line in the forward part of the blank. The ruler is aligned with the points on the right side of the center line, and a line is drawn between them and extended to the center line. If the two extension lines do not cross the center line at the same point, a mistake has been made in laying off the dimensions or in drawing the lines. The mistake should be found and corrected. The round corners of the magazine box are drawn with a pencil compass set to the correct radius.

After the complete outline of the magazine box is drawn on the bottom of the blank, the inletting begins. The blank is clamped in the vise with the magazine box outline facing up. With two C-clamps, a two-foot carpenter's square is clamped to the blank. One of its edges follows the outline and extension line of the left side of the magazine box. With the edge of the square as a guide, a cut one-eighth inch deep is made with a pocketknife along the outline of the box. The cut is made no farther than to the beginning of the round corners. The cut is widened with a scoring hook. The outline of the right side of the magazine box is cut and scored in the same manner. The wood is cut along the outline of the ends and round corners to a depth of one-sixteenth inch with a one-half inch flat wood chisel and a small half-round wood chisel.



Length of magazine box is first measured and marked on top of blank. Lines through the marks across top, down side, and across bottom will transfer measurements to bottom of blank. Width is marked directly on blank

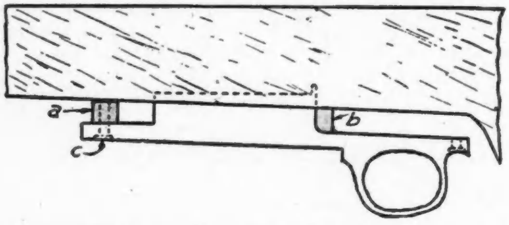


After size of box is marked off, outline area to be inletted. If extensions of lines for sides of box do not cross at center line, measurements are incorrect and must be taken and marked on blank again

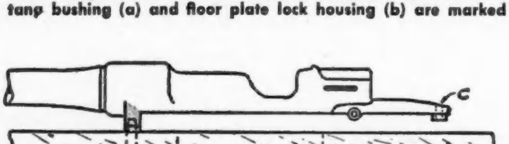
The wood inside of the magazine box outline may now be removed without splintering or chipping the surface wood around the outside of the outline. The bulk of the wood is removed by drilling as many holes as possible, without touching the scored and chiseled lines, completely through the blank and at right angles to the top of the blank. An electric drill press is convenient, but a hand brace and a one-quarter inch or a one-half inch bit are satisfactory. The remaining wood inside of the outline is removed with chisels to a depth of about one-eighth inch from the bottom side of the blank.

Spotting determines which parts of the wood inside of the outline are removed next. With lampblack smeared on the magazine box, the top of the box is inserted into the existing mortise from the bottom of the blank. It will go into the mortise about three-sixteenths of an inch. Care is always taken to place the box in the mortise so that its ends are perpendicular to the top of the blank, and so that it is not canted sideways. After pressing the box firmly into the wood, the magazine box is removed from the mortise. The blackened wood is carefully chiseled off or scraped off with a knife blade. A tight fit between the box and the wood is maintained by removing only enough of the spotted wood to allow the box to be pushed into the mortise with a slight pressure.

When the box has been inletted to a depth of about three-eighths inch, the guard front tang bushing and the floor plate lock housing touch the bottom of the blank. With the magazine box in the mortise and by using the front connecting screw hole through the front tang and the bushing as a jig, a three-sixteenth inch hole is drilled one-half inch deep into the bottom of the blank. The box is removed from the mortise. A one-half inch hole (the same diameter as the bushing) is bored three-fourths inch deep and perpendicular to the blank's top by using the three-sixteenth inch hole as a guide for the point of the bit. The hole is the bushing mortise. Later, it may have to be bored slightly deeper if it is found to be too shallow. The magazine box is now inletted farther into the blank by spotting the box and the floor-plate lock housing and removing the indicated wood. With a fraction of an inch more of inletting, the inside surfaces of the guard front and rear tangs touch the blank.



When magazine has been inletted a little, locations of front tang bushing (a) and floor plate lock housing (b) are marked



After magazine box is inletted completely, receiver and barrel are positioned on the screw (b) through the front tang bushing

When the tangs touch the blank, their outlines are traced onto the wood with a sharp-pointed, hard pencil; then the magazine box is removed from its mortise. The wood is cut with a pocketknife and scored with a scoring hook along the outline of the tangs' sides to a depth of one-eighth inch. The procedure is the same as that used for cutting and scoring along the outline of the magazine box sides. The round ends and corners of the tang outlines are cut one-sixteenth inch deep with half-round wood chisels. Inletting is continued by spotting the magazine box, floor plate lock housing, and guard tangs and removing the blackened wood. The guard assembly is completely inletted when the outside surfaces of the tangs are flush with the surface of the blank. The sides and ends of the magazine mortise between the top of the magazine box and the top of the blank are chiseled to approximately the same size as the lower part of the mortise.

If the gunstock shrinks, the magazine box mortise will become narrower. The sides of the mortise should be scraped with a knife blade until a .005-inch feeler gauge will pass between each side of the magazine box and the mortise. The ends of the magazine mortise and the tang mortises are left untouched. Their close fit with the ends of the magazine box and the tangs helps distribute the recoil of the rifle over a greater stock area and gives almost watertight joints.

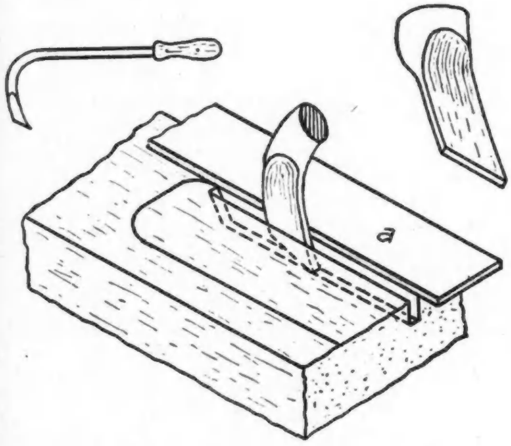
The Receiver and Barrel—The bolt, bolt stop, trigger, and sear are removed from the receiver, and the barrel band is removed from the barrel. With the barrel attached to the receiver, both are inletted into the top of the blank at the same time. The first step is to position the receiver and barrel on the top of the blank with respect to the magazine box and the top center line.

The magazine box is placed in its mortise and left there throughout the receiver and barrel inletting. Again the front connecting screw hole through the guard front tang and bushing is used as a jig, and a three-sixteenth inch hole is drilled completely through the blank. This hole must be perpendicular to the top of the blank and be bisected by the top center line. A machine screw three inches long and three-sixteenth inch in diameter (the same diameter and threaded the same as the front connecting screw) is screwed tightly into the front connecting screw hole in the recoil lug and the lug bushing. The sides of the head of the screw are filed flush with the body of the screw. When the screw is inserted into the three-sixteenth inch hole through the blank, the receiver and barrel are correctly positioned with respect to the magazine box. The receiver and barrel are aligned with the top center line by moving the receiver tang so that the rear connecting screw hole through the tang is bisected by the center line. Care is taken to correctly position the receiver and barrel each time they are placed on the blank throughout the rest of the inletting.

The recoil lug, lug bushing, and receiver tang bushing are spotted and inletted into the blank with wood chisels until the flat of the receiver rests on the top of the blank. The outline of the flat of the receiver and the receiver tang is traced onto the blank with a pencil. The wood along the outline of the sides of the tang is cut with a knife blade and scored with a scoring hook to a depth of one-eighth inch. The wood along the outline of the receiver and the end of the receiver tang is cut one-sixteenth inch deep with wood chisels. Before the inletting is continued, the outline of the barrel is drawn on the top of the blank.

The first step in drawing the outline of the barrel is drawing lines (called stations) across the top of the blank. These lines are drawn perpendicular to the blank's right side with a pencil and a try square. The first station is drawn at the point where the barrel joins the receiver when the receiver and barrel are correctly positioned on the top of the blank. Stations two, three, and four are drawn at one-half inch intervals toward the front of the blank. The remaining stations are drawn at two-inch intervals to the fore-end. The stations are then marked on the barrel with crayon or chalk.

The diameter of the barrel is measured at station one with a pair of calipers, and the dimension is divided in half with six-inch dividers. A half dimension is laid off on each side of the center line at station one on the blank. The diameter of the barrel at other stations is laid off on the blank in the same manner. With the receiver and barrel positioned on top of the blank, the outline of the barrel is drawn by running a long-leaded pencil along each side of the barrel and connecting the points marked in each station.



This is the correct way to use the scoring hook

The wood is cut along the barrel outline with a pocketknife. A straight-edged ruler is clamped to the blank as a guide. Because of the curvature of the outline, only short cuts with the knife can be made before the ruler needs repositioning. Also, the cuts are made at an angle so the bottom of the cuts are inside of the outline. The cuts are widened with a scoring hook.

After the cutting and scoring, the wood inside of the outline is removed with a half-round chisel to a depth of about one-quarter inch. The receiver, receiver tang, and recoil lug are spotted and inletted into the wood until the barrel touches the bottom of the groove; then the barrel is spotted and inletting continues. Short lengths of old rifle barrels make good scrapers for removing the wood from the barrel groove. With the ends of the lengths of barrels filed flat and perpendicular to the line of bore, the edges around the ends of the barrels scrape off the wood when they are pushed along the barrel groove.

The only parts of the barrel groove surface which have to fit the barrel snugly are: (1) A full-length section three-sixteenth inch deep on each side of the groove, (2) a section extending all around the groove two inches long where the barrel band is located, and (3) a section extending all around the groove one inch long at the fore-end. The rest of the groove is scraped slightly deeper.

All parts of the receiver fit snugly into the wood, particularly the rear of the recoil lug. An adjustable routing plane is used to remove the wood from the bottom of the receiver mortise. The routing plane removes the wood uniformly so that the flat of the receiver and the receiver tang rest evenly on the bottom of the mortise.

When the barrel has been inletted to a depth of one half of its diameter, the barrel and receiver are compeltely inletted. If no mistakes were made during the inletting so that the parts had to be inletted deeper and the blank planed off, the extra one-quarter inch of wood still remains on the bottom of the blank. The guard assembly is inletted farther into the blank until the top of the magazine box is one-sixteenth inch from the flat of the receiver. This one-sixteenth inch clearance allows the receiver and the guard assembly to be pulled tightly into the wood with the connecting screws. The bottom of the blank is planed off to the surface of the guard tangs. A one-quarter inch hole for the rear connecting screw is drilled through the blank.

The Barrel Band, Sear, and Trigger—The barrel band is placed in its proper position on the barrel. The band and its lug are spotted and inletted very snugly with wood chisels. When they are completely inletted, the bottom of the lug mortise is deepened an extra 3/32 inch. A hole the exact size of the barrel band tension screw is drilled through the blank from the bottom of the lug mortise. The hole is perpendicular to the top of the blank. The head of the tension screw is inletted until the surface of its head is flush with the blank.

Next, the sear is attached to the receiver. It is spotted but loosely inletted because it is an actuating part.

The outline for the trigger mortise is traced from the trigger slot in the guard rear tang onto the bottom of the tang mortise. The trigger mortise extends from the bottom of the guard rear tang mortise to the bottom of the sear mortise. The wood inside of the outline is removed with a drill and chisels. The trigger is attached to the receiver, and the barrel, receiver, and guard assembly are fastened in the blank with the connecting screws. If the trigger and sear do not work freely in their mortises, they are spotted and the obstructing wood is removed. *(To be continued)* ◆ ◆ ◆

NRA GALLERY LEAGUE CHAMPIONSHIPS

Rifle and pistol leagues have until December 15 to make entry in the 1947-48 National Rifle Association's Gallery League Matches. Again this year leagues may fire any course they wish and the complete operation of each league will be left to the officers, though all league firing will be done under NRA shooting rules.

In making entry, the league secretary should send a copy of the league firing schedule and the names and addresses of team captains with the name of the team each represents. Entry fee is $5 per team except that no league shall pay less than $15 nor more than $25. Mail entries to the National Rifle Association, 1600 Rhode Island Avenue, Washington 6, D. C.

Indoor Snapshooting

By JOHN A. ROOS

THE STATEMENT THAT one may acquire considerable skill in the art of snapshooting with but little indoor training may seem a bit farfetched. To further claim that the devotee will find it an interesting pastime, one in which he can compete with fellow riflemen without burning ammunition, may make it appear that the writer is seeking top honors in the annual event staged by the Liar's Club. To doubters it may be pointed out that the simple methods and equipment described below have met with the approval of expert riflemen.

The equipment for learning snapshooting indoors can be set up in a basement or any other space over thirty feet in length, as distance can in part be compensated for in target size. Designated by others as the "Roos System of Night Rifle Firing" and devised for rifle work, it is believed this equipment and technique can be adapted to serve pistol and shotgun fans also. An indoor snapshooting range could prove an attraction for gun club members.

Equipment needs approximate the following: A half dozen six volt lamps, a like number of light sockets, a six volt wet battery or its equivalent in dry cells (don't attempt using 110 volt house current), some fairly heavy, covered wire and flexible light cord. Wire lengths will depend upon the size of the room available. Any electrician can advise what size of wire is required if he is given the distances involved. Other requirements are: A half dozen paper cartons, white wrapping paper, mucilage, friction tape, and lamp black, plus luminous paint for outlining targets.

To make the snapshooting trainer, start in by cutting the bottoms out of the paper cartons. Cover each opening with a piece of white wrapping paper, which is where the mucilage comes into use. Outline the targets upon the wrapping paper windows with a lamp black and water mixture. Spot the center of each target with luminous paint since practicing must be done in a darkened room. Circles and horizontal and vertical slots are suggested for target shapes.

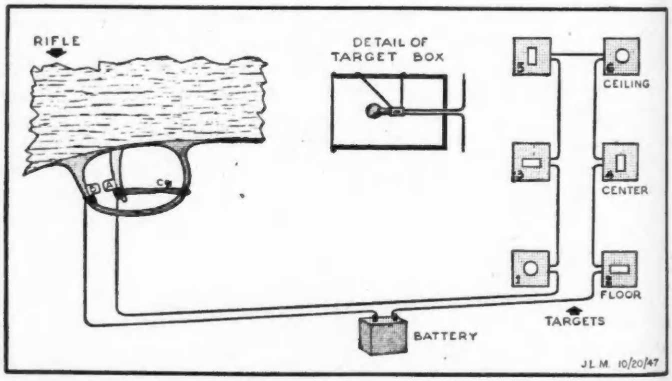
For scoring purposes mentally number the targets as follows: One and two in or near opposite floor corners of the room, two and three midway to the ceiling, and four and five near the ceiling. Place those with odd numbers on one side, even on the other.

Hook up the light sockets in series so that a lamp can be placed in the center of each box. Reflectors such as one can cut from tin cans are useful. The box tops should be put on after the lamps are in position. Run the heavy wiring to the opposite end of the room or the rifle stand. Attach a twelve-foot length of flexible cord to the heavier wiring and, with friction tape and perhaps a small pair of clips, make a connection to both rifle trigger and trigger guard in such a manner that squeezing the trigger will complete the electrical circuit and light the lamps (see drawing).

The rifle can be used with hammer down most of the time, but you may have to use a rubber band or other simple device to break the circuit quickly after removing finger pressure from the trigger.

Then darken the room so the luminous dots can but faintly be seen, and the rifle sights are indistinguishable. Point the rifle at the target and squeeze the trigger. If all is in order, the position of the gun sights with respect to the target, outlined with lamp black, will be instantly visible. With only a little practice you can call your shots almost as well as if you were using live ammunition. Score cards can be kept in a small box containing a small lamp on the house circuit, or you can use poker chips and a half dozen small boxes into which to toss the color designating either hit or miss. Keep the scoring for each target separately so that you can find your weak angles, whether high or low. Date the record card after each practice period so that you can determine your progress from time to time. Several rifles can be placed in the circuit and used on the hook-up.

Form the habit of bringing the rifle to shoulder quickly from the various positions in which you might be carrying it when hunting, also from turns to right and left. Always snap the rifle to the shoulder as firmly as you would in actual firing, when you are expecting recoil. Above all, forget that the rifle has sights upon it excepting during illumination. Practice slowly at first. Speed and accuracy will come in less time than you believe possible. Use the rifle which you intend to use in the field.



With a rifle in circuit with lamp-targets, a shooter can learn snapshooting indoors in a darkened room. He throws the gun to his shoulder, pulls trigger, and target lights up when pieces of metal on trigger (a) and trigger guard (b) make contact and close circuit. The sights are then visible against the lighted target

While practicing indoor snapshooting, you will harbor a suspicion from time to time that anything as difficult as it may seem cannot be mastered in such a convenient and simple manner. Bear with this distrust until you have had five or more hours practice.

After indoor practice take your rifle to the field or to the hills and expend a box of cartridges in checking what you have accomplished with indoor practice. You will not be disappointed. About all that you will have missed in indoor training is the discharge and recoil of your rifle. ◆ ◆ ◆

SHOOTING IN NORWAY

By FRANTZ ROSENBERG

HAVING FOLLOWED THE DEVELOPMENT of American military rifle shooting in the pages of THE AMERICAN RIFLEMAN for a great many years, I think our efforts in Scandinavia, particularly in my own country Norway, to approach actual combat conditions and to make our military rifle shooting as practical as possible might be of some interest.

Like the United States, Norway has its National Rifle Association. Subsidized (very poorly) by the government, this organization has affiliated rifle clubs all over the country in which shooting is carried on with the military rifle under rules laid down by the Association.

Besides the National Rifle Association, there is the great *Norges Sportsskytter Forbund*—the Norwegian Sport Shooting Association—which embraces all clubs for International free rifle, small bore, trap, pistol, and running deer shooting. This Association is not subsidized by the government. The two other Scandinavian countries, Denmark and Sweden, have similar organizations in close co-operation with it, as have the Finns.

The Norwegian Army rifle is the Model 1898 Krag-Jorgensen in 6.5 mm. caliber, using the 6.5 x 55 mm. case. This case holds a little more powder than the 6.5 mm. Mannlicher-Schoenauer cartridge and is loaded with a beautiful boattail bullet weighing about 140 grains that shoots at a velocity of about 2,500 feet per second. The Krag-Jorgensen is a very accurate and extremely well-made rifle which has the best pistol grip stock the writer has ever seen on an issue army rifle.

Besides the long infantry rifle, which has a thirty-inch barrel, there is a short model with the barrel completely encased in the wooden forearm and handguard. This is a handy but not very accurate rifle. However, in order to accommodate the wishes of the expert riflemen, the Association has allowed a heavier barrel in the long infantry rifle besides the use of a modern micrometer-adjusted receiver peep sight. Of these sights, the Lyman 48 is a great favorite.

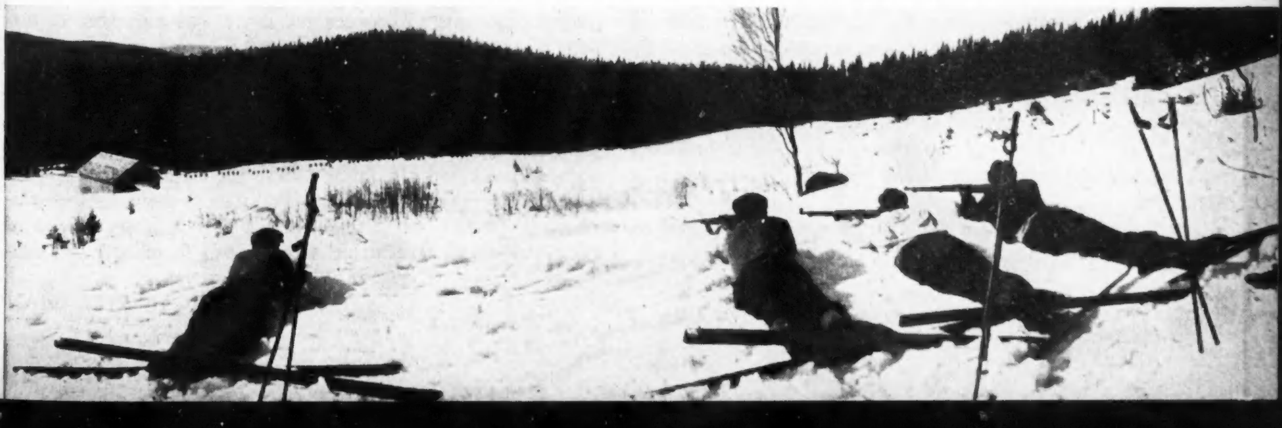
Another model which is also officially recognized by the Association has the forearm cut off in front of the barrel band. This model has a very heavy barrel, a micrometer peep sight, and an aperture front sight. Though officially recognized as an "experimental military rifle" and allowed in all competitions, it is a sniper or match rifle pure and simple, developed for the yearly competitions between the capitals of Sweden, Denmark, Norway, and Finland. The Swedish "experimental model," which uses the same cartridge, has a Mauser action and is even more of a camouflaged match rifle.

The rifle ranges which are found in every little community usually have nice clubhouses and butts for targets at 100, 300, and 600 meters, and in some cases 800 meters, with several self-registering targets at intermediate ranges for use in rapid fire. Two of these targets are very interesting types which have become extremely popular. The "faces" of these are made out of armor steel, the larger one representing the outline of a kneeling soldier. This plate is about twenty-three inches in height and nineteen inches broad, and is divided horizontally in the middle, the upper plate overlapping the lower. By means of a simple system of levers and springs, a hit on the target is registered by a colored "flag" which appears on the righthand side for a high hit and on the lefthand side for a low hit. This target is used for ranges from 200 up to 400 meters. A smaller type, affectionately dubbed "the small'n," has only one elliptical face about ten by twelve inches and a hit is registered by a white "flag" which shows above the target. This type is used for ranges from 150 to 175 meters. Both targets are mounted on a couple of planks, with convenient handles so that two men can easily carry them into position. Against a natural background, they are not too easily seen and give extremely good practice in rapid fire at unknown ranges.

FIELD SHOOTING COUPLED WITH CROSS-COUNTRY RUNS ON SKIS OR ON FOOT TEACH NORWEGIAN CIVILIAN RIFLE-CLUB MEMBERS AND SOLDIERS PRACTICAL USE OF THE MILITARY RIFLE . . .

Straight range practice at known distances must always form the basic education of the would-be military rifleman. However, we have found it essential that he also learn to use his rifle effectively under the different conditions encountered

Shooters, still wearing skis after cross-country run, fire at targets lined up near the foot of the hill. This course is typical of Norwegian "field shooting"



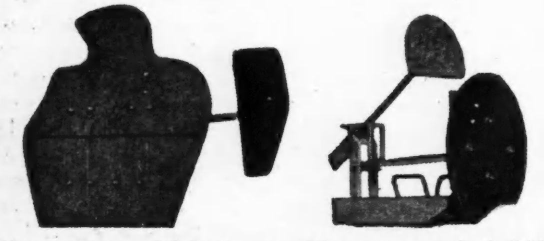
in the woods, in the mountains, or in our cold winter weather when the ground is deeply covered with snow. Thus, our regular range shooting is mostly carried on during the summer or early autumn months. However, during the winter we stage a series of "field shoots" or long-distance ski-running competitions combined with both rifle and pistol shooting.

These field shoots necessitate suitable country, preferably large open moors or snow-covered lakes surrounded by a forest, with a safe background. Such country is easily found almost anywhere in Norway, even close to the larger towns, so local rifle clubs usually stage at least two such shoots every winter.

The three or four club members who form the committee in charge of such a shoot have a job on their hands. The country must be scouted as secretly as possible for a suitable range location, so as not to give any too-keen competitor a chance to go over the ground before the shoot and measure the distances to the targets.

On the evening before a shoot, usually a Saturday, the committee with some helpers will load a truck with a sufficient number of regulation silhouette targets nailed to boards for placing in the snow, plus spare boards, spare targets, and other materials and tools. If the shooting ground happens to be far off in the woods, all the stuff may have to be shifted over to a ski-sledge at the end of a logging road and pulled to the area by the committee.

As a rule the program calls for targets at three or four unknown distances besides one or two self-registering targets for rapid fire. The silhouette targets employed are either one-quarter size showing only head and shoulders of a soldier or one-third size showing head and shoulders down to the waistline. These are the same size as the larger of the self-registering targets already described. The targets are set up in groups of five, three to four yards between groups, with the number of groups varying according to the number of competitors. The quarter-size targets are usually placed at from 150 to 175 meters from the firing point, which is marked by pine branches put down into the snow. The one-third size targets are placed at from 250 to 350 meters. For longer ranges we have half-size and three-quarter size targets. The firing points are placed so that the targets may be inspected and patched without danger from stray bullets from other firing points.



These two targets, faced with armor plate, are very popular in field shooting. The outline of a man kneeling (left), twenty-three inches high, is used at from 200 to 400 meter ranges. "The small'n," showing lever and spring arrangement that raises a white flag to signal a hit, is used at ranges of 150 and 175 meters

Frantz Rosenberg's articles on shooting in the Scandinavian countries have been appearing in The American Rifleman *for many years. As the Norwegian National Rifle Association's representative on his country's National Defense Board, he is much interested in American .30 caliber shooting at the National Matches. A veteran big-game hunter, he is at present hunting elk and mule deer in Idaho with his old friend Elmer Keith. This is the second time Rosenberg has hunted in this country.*

Early Sunday morning the committee must be astir and on the spot, placing the targets and making everything ready. Somewhat later the competitors meet at the clubhouse or some other designated spot, pay their entrance fees, and receive their squad number. There are five men to a squad, including the squad leader who carries the official score book of the squad. Each competitor also gets his group and target number, which is the same for all the series.

Finally the first squad with its leader moves off on skis, carrying rifles and ammunition and representing a military patrol looking for the enemy. The track is laid through forest, with certain objectives along it which must be observed and the range estimated. When the squad finally reaches the firing point and the targets are found, the shooting begins under command of a committee member on the spot.

The series usually calls for twelve shots, or two magazines full, at each range, and four shots standing, four kneeling, and four prone are fired in a time limit.

If there are not too many competitors, it is an advantage for the squad to accompany the markers up to the targets and see for themselves their hits or misses. They learn more from this than from receiving, after the end of the shoot, a small miniature target with the hits marked on it.

In this manner squad after squad comes up and the first squad shoots and moves off to other firing points or to the self-registering rapid-fire targets. These are great fun. You fire at the word "go" and try to get as many hits as possible within the time limit.

It seems to be a belief in America that the old Krag cannot be reloaded quickly by means of a clip of five cartridges, but we have evolved several very practical methods which we use in these rapid-fire series.

As the shoot is going on, those who have finished gather round a big fire where coffee pots are boiling and lunches are opened. These ski runs are great fun but the shooting can be very difficult, especially the estimation of wind and range, when the sun is glaring on the snow. On a mountain plateau we may experience a small blizzard, as we did during the last shoot in which I took part.

Last winter the writer arranged a shoot for the Lillehammer Rifle Club, where besides the regular targets I had set up roe deer targets (about the size of a whitetail), regulation running deer targets (European red deer) and a number of targets representing the Capercailzie, the great northern game bird *(Tetrao urogallus)* the size of a wild turkey, which offer a wonderful target to the rifleman-hunter when they feed in the tops of the fir trees in winter. Such animal targets always seem to puzzle the real target sharks and help to even scores because, of course, the hunters have the advantage.

A considerably more strenuous affair is long-distance ski-running combined with shooting. This is a favorite form of competition and several big shoots, open to officers and conscripted soldiers, are staged every winter by the military authorities. The course is usually 30 kilometers, or roughly nineteen miles, and the competitor has to carry a military pack of a certain weight besides his rifle. At a certain point along the course will be a firing point where he has to fire ten or twelve shots for record. One minute is deducted from his time along the course for every hit. Competitors are classed according to age. The regular club shoots of this kind are usually over a shorter course, about ten miles or so, but laid through difficult country which calls for staying power and skill in skiing. The shooting is also quite difficult because it is not so easy to calm down after a hard run and quietly squeeze 'em off.

A distant view of the running deer target on a Norwegian club range. Target is powered by momentum gained from grade at each end of run

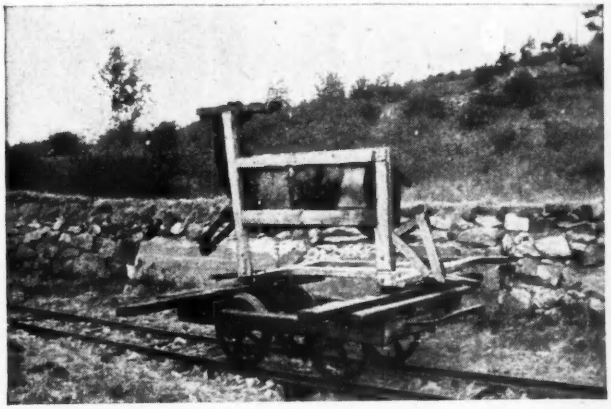
With a great many competitors, which is the rule, good organization is called for to prevent too many from arriving at the same firing point at the same time. Each shooter is given a slip of paper with his target group number and target number on it. And though both targets and groups are conspicuously numbered, it very often happens that a shooter fires at the wrong target, spoiling the score both for himself and the other rifleman.

As no marking of the targets is possible during the competition, it is necessary to have one for each competitor, which means a great many targets and a large area for placing them.

Similar field shoots can be arranged in summer as well, with competitors travelling cross-country on foot instead of on skis.

Another form of competition in which a series of shots is fired with either the rifle or the army pistol has lately become very popular in Scandinavia. A course or track, unknown to the competitor and not marked, is indicated on a map carried by each competitor. By means of his compass he has to find the shortest route between start and goal, passing certain control posts on the way. The competitor fires a series of shots at targets set up near these control points. This form of competition is very valuable from a military point of view.

Another form of practical target shooting, which ever since the 1912 Olympic Games in Stockholm, Sweden, has been very popular with us, uses a life-size silhouette of a European red deer mounted on a carriage running on a narrow-gauge track. An incline at each end of the track gives the "deer" a fairly even speed to cover the 50 to 60 yards of open in about three and one-half to four seconds. The range is 100 meters and the series is five single shots each way and five double shots each way, thirty shots in all, with two trial shots for each series.



Mounted on a narrow gauge railway truck, the running deer target travels over a fifty-yard distance. Total time of run is about four seconds

In the double-shot series, it is necessary to load a second clip during the run. I know of no better way to become a quick handler of a military bolt-action rifle than this running deer shooting. By using a double-barreled rifle or an automatic, there are certain advantages, of course. Even so, the best scores have always been made with Mausers or Krags and our special ammunition with a light, 80-grain, pointed bullet of 3,000 feet per second velocity. These cartridges allow one to aim at the deer and not in front of it, which is necessary with slower ammunition. For military training a couple of man-targets may be substituted. It is very good sport, and I have noticed that the installation of a running deer range often puts new life into the activity of our rifle clubs.

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Getting the Range

(Continued from page 19)

The Harding Club became very popular in Cleveland during the war as a pre-induction training center. Several hundred received this training. At this point the Lakewood Rifle Club, Inc., an adult organization, stepped in and gave us some much needed assistance. Since then the Lakewood Club has stayed on and is making its headquarters with us.

Many educators have asked if rifle marksmanship pays from the standpoint of education. I believe it does. There are three reasons for the above statement: (1) It gives those physically handicapped and less rugged individuals a chance to excel; (2) it will tame the most incorrigible and unreasonable bullies; and (3) it is a splendid tonic for a "case of nerves." I know of no other sport that has a greater opportunity for building good citizenship. Good rifle sportsmanship rules are identical to good citizenship. My greatest regret is that few educators and adults recognize the value of a shooting club in their school or the school which their youngster attends. If they do, they are unwilling to exert enough effort to do something about it.

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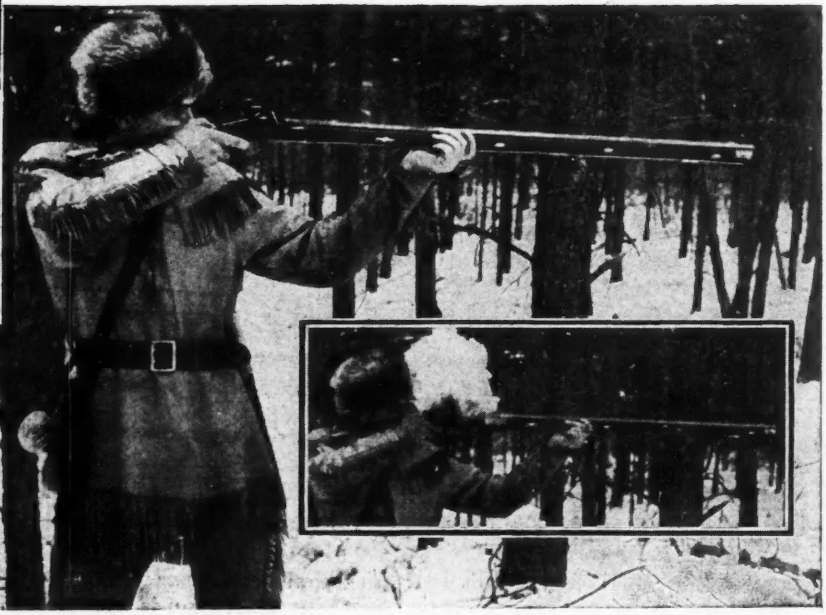
By LES FITZGERALD

SPARKS,



The hunter with the flintlock rifle gets only one shot, and lots of smoke. He must kill with that shot

THE DEER COUNTRY OF Michigan's lower peninsula is a land of ridges, plains, and swamps thickly covered with second growth timber. Seldom is a shot obtained at more than 100 yards. Such conditions are ideal for hunting with the Kentucky flintlock rifle,* which is essentially a short-range weapon.

Let it be understood that the writer is an admirer of all fine arms, be they ancient or modern, American-made or foreign. And having a leaning toward the ancient arms and a curiosity as to their effect on game, it was decided to give them a trial. The deciding factor was my fourth buck, shot in 1938 with a .30-'06 at thirty paces, walking. It seemed that a muzzleloader would offer far better sport at such short ranges.

Perhaps the flintlock rifle would give the game a little better break. Many things can happen. If the flint is dull or loose, there may be no spark. If the powder is damp, the sparks will not ignite it. Should the vent be clogged the only reward is a flash in the pan, and your buck goes gamboling happily onward. However, with careful attention to these details and proper loading, the Kentucky will certainly fire without lag and excellent results may be obtained.

About 1800, a Pennsylvania riflesmith named J. Sneveley made the flintlock rifle which I was to experiment with nearly 140 years later. The barrel was forty-three inches long, about .53 caliber, eight deep groves with one turn in forty-eight inches. A .522-inch round ball, weighing 210 grains with .017-inch greased ticking patch, backed up by a priming charge of 14 grains of FFFFg black powder and a main charge of 66 grains of FFg black, gave me the accuracy I needed. With that combination, the old rifle shot consistently in the black of the standard rifle target at fifty yards.

Velocity was considered, and tests conducted by Frankford Arsenal were consulted. These showed that a flintlock rifle of .45 caliber, shooting a round ball with 66.5 grains of FFg black powder gave 1565 feet per second at fifty-three feet from the muzzle (Dillin's *The Kentucky Rifle*). A test by the University of California's ordnance department with a rifle of .45 caliber showed muzzle velocities up to 2150 feet with 100 grains of black powder. As a comparison, the Ideal Handbook shows the velocity of the .44-40, 210-grain lead bullet to be 1270 feet per second. Jacketed bullets, of course, and smokeless powders attain higher velocities, up to 1800 feet. But that old .44-40 load had accounted for many a deer. There was no reason why my flintlock should not do as well.

That fall, 1939, a buck presented a standing shot at sixty yards. At the report of the rifle he wheeled and disappeared over a ridge. He ran seventy yards and fell dead. The ball had entered the left shoulder, cut off the top of the heart, and gone out through the right ribs. This was perhaps the first deer to fall to a flintlock rifle in Michigan in almost a century. The old rifle had produced in spite of all the skepticism and sarcasm leveled at it and its owner.

The next two seasons, 1940 and 1941, two more bucks fell to the old Kentucky. Both were shot through the neck and dropped instantly. One was running at about fifty yards (a lot of luck there), and one was shot standing at about the same distance.

The next season, 1942, brought the great calamity. "My buck" was walking uphill toward me at about sixty-five yards. Having always been told to aim low when shooting downhill to prevent overshooting, I did just that. The result was enough hair to stuff a pillow, a little skin, and a badly scared and activated buck who leaped out of sight instantly and is still run-

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* *The costume worn by Les FitzGerald is not to be recommended for actual field shooting unless one is sure of his territory and other hunters' judgement!*

CHARCOAL *and* DEER

ning, I think. No other opportunity was presented that season.

Since that one bad year, the flintlocks have accounted for an uninterrupted period of prosperity. In 1943 a spikehorn fell with a ball through the neck at sixty-five yards and the old Sneveley was hung back on the rack, retired with highest honors.

For the season of 1944, a flintlock rifle by I. P. Beck, a Pennsylvania maker of the Revolutionary period, was chosen. This rifle used a .510-inch ball, weighing 203 grains, with a .015-inch greased patch of duck and the same powder charge as the Sneveley. The barrel was forty-three inches long, with seven groves, one turn in fifty-two inches. It gave fine accuracy in preseason tests.

On the last day of our 1944 hunt, a buck showed his head and shoulder from behind a tree at about seventy yards. At the crack of the rifle he gave a mighty leap and ran downhill seventy-five yards to fall dead. How he ran that far I don't know, for the ball had entered behind the left shoulder, smashed the heart to bits and broken the right shoulder at the joint. The ball was later recovered. It had flattened out to the size of a quarter.

About this time considerable controversy arose regarding the killing power of round balls of various calibers. Specifically, was the .45 caliber ball large enough for deer? I maintained that it was but I had no rifle of .45 caliber at the time. The next best thing was to try one of .38 caliber. This was a fine rifle by Jacob Sell, a Pennsylvania smith of about 1800-1820. The barrel was forty-three inches long, seven grooves, one turn in fifty inches. The penetration of the .375-inch round ball was not impressive and was ruled out. Merely out of curiosity a .375-inch conical bullet, weighing 137 grains, and cast in an old Colt mold, was tried. It gave surprisingly good accuracy, without keyholing.

The Colt bullet is so designed that it can be loaded without tipping, and so does not lose its relation of axis to bore. Most muzzleloaders designed to use the conical bullet employ a guide starter to insure proper alignment of bullet while seating. Experiment proved that when used with a greased cross patch of .014-inch duck and 35.5 grains of FFFg black powder, it would give improved accuracy and had a very flat trajectory at 100 yards. Also it gave greater penetration than round balls of larger caliber.

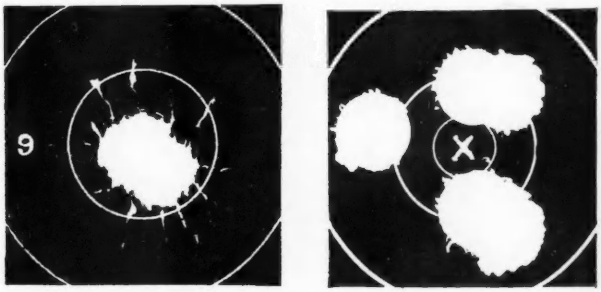
The penetration tests may be of interest. They show, in some measure, the penetration of these three flintlock Kentucky's in comparison with the Winchester .44-40 Model of 1873. I believe it has been said by some authorities that more game and men have been killed with the 1873 Winchester than with any other sporting rifle ever made. The .44-40 cases in question were handloaded with 32.5 grains of FFg black. This was about all the powder the cases would hold and still allow the bullet to be seated. Here are the results:

Rifle	*Projectile*	*Weight Grains*	*Caliber*	*Black Powder, Grains*	*Penetration at 50 yards, soft pine*
Winchester 1873	Lead bullet	210	.44–40	32.5 FFg	5 3/4 inches
J. Sneveley	Round ball	210	.522	80 mixed black	5 1/4 inches
I. P. Beck	Round ball	203	.510	80 mixed black	5 3/16 inches
Jacob Sell	Round ball	80	.375	35.5 FFFg	3 3/8 inches
Jacob Sell	Conical bullet	137	.375	35.5 FFFg	5 7/8 inches

When the hunting season of 1945 rolled around, an eight-point buck obliged with an easy shot at forty-five yards, walking. When hit, he ran in a tight circle of not more than fifteen yards and fell, a clean kill. The bullet had entered the right shoulder, passed through the lungs, the ribs, and lodged against the skin. It was later recovered, beautifully mushroomed.

Again in 1946 the same rifle was used, and the most exciting hunt of all occurred. Another eight-pointer showed up, offering a shot at about fifty paces. He was coming toward me over the crest of a knoll. My idea was to break his neck. The idea was good, the flight of the bullet was true, but the judgment was poor. My aim was not high enough to connect with the neck bone. Anyway, the buck went down.

While congratulating myself on a job well done, the buck started to kick and thrash around. This is uncommon for deer with broken necks. I started to reload, fast. As the loading progressed, so did the buck's activity. Both became feverish. Up got the buck and staggered off down the knoll to fetch up against a tree. The loading was finished just as the buck got to his feet again and took off. He was seventy yards away and really running when I got the rifle primed and took a shot through the popples, seemingly without effect. He disappeared in a thicket, but I came upon him a short way in, quite dead. He was bled out completely.

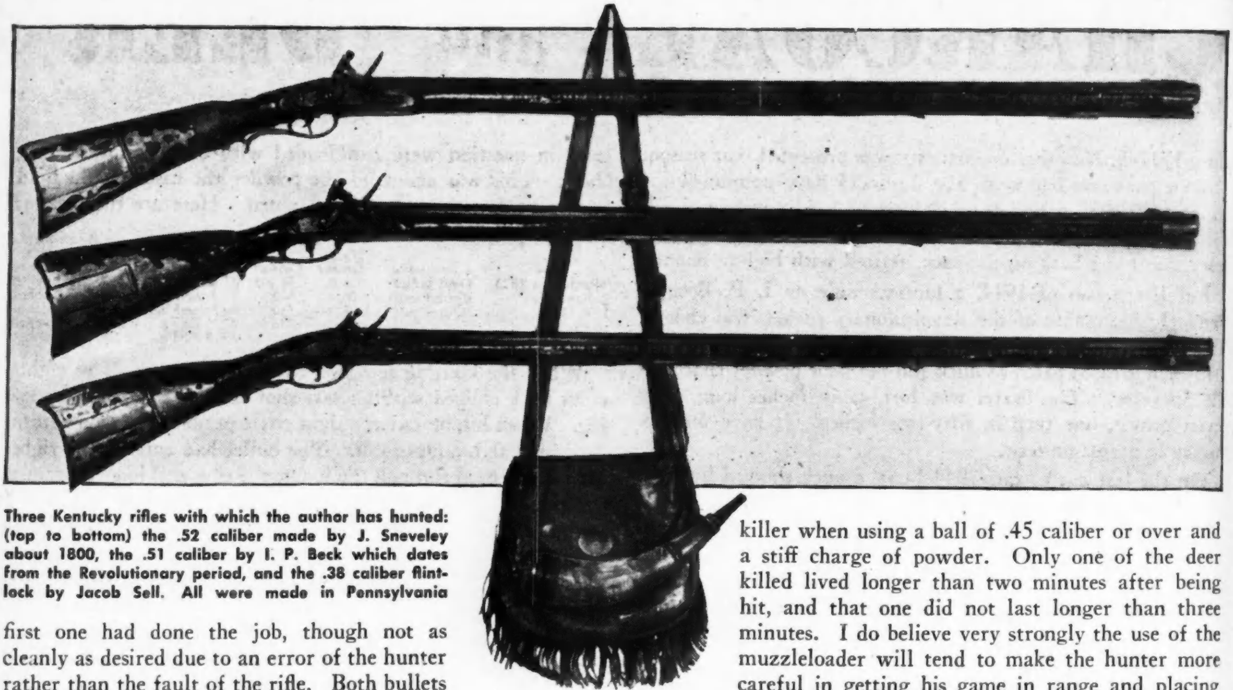


The .52 caliber flintlock grouped like this at 50 yards. The three-shot group (left) was fired from rest, the other group is a five-shot composite

That first shot had entered the chest and passed through the lungs high up and ranged almost the full length of the deer to lodge in the spine in front of the hips. This knocked him down and stunned him. To my surprise the second shot took effect just in front of the left hip and coursed through the body cavity to lodge in the right shoulder. The second shot proved to have been superfluous. The

Flintlock rifles by the score can be found in museums and over mantels. But fire one?-- No, they're showpieces. Yet one hunter has taken seven deer in eight seasons with muzzleloading guns over 125 years old.

47- 48 missing



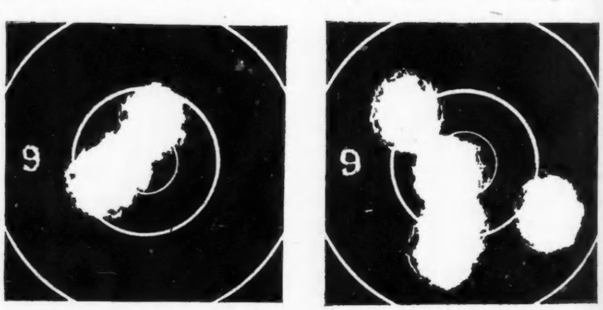
Three Kentucky rifles with which the author has hunted: (top to bottom) the .52 caliber made by J. Sneveley about 1800, the .51 caliber by I. P. Beck which dates from the Revolutionary period, and the .38 caliber flintlock by Jacob Sell. All were made in Pennsylvania

first one had done the job, though not as cleanly as desired due to an error of the hunter rather than the fault of the rifle. Both bullets were recovered, well mushroomed.

Another instance of hunting with the flintlock rifle occurred the same year. Mr. Francis Slyker of Detroit went after deer. His equipment was a U. S. Rifle, Model of 1817, made by Nathan Starr. The barrel was thirty-six inches long, .54 caliber, and he used a half-ounce round ball with .014-inch greased linen patch and 86 grains of FFg black powder. While hunting near Houghton Lake he spied a buck at the far end of a clearing. He estimated the range at 100 yards or more and held a coarse bead at the top line of the shoulder. The buck went down for keeps and was dead in less than two minutes. The ball had broken the spine and a sliver of lead or bone had punctured the lungs. This buck had a twelve-point rack and weighed 142 pounds dressed.

Not being a ballistics expert, perhaps I am not qualified to make the following remarks. However, they are my personal observations over a period of years. In all of these kills I have observed no "shocking power" or paralyzing effect from the muzzleloaders as compared with that of the high-powered rifles. None of these deer were knocked off their feet unless the ball hit the spinal column. Apparently shocking power comes from very high speed or expanding-point bullets, and the muzzleloader can boast of neither.

On the other side of the ledger, the muzzleloader is a good killer when using a ball of .45 caliber or over and a stiff charge of powder. Only one of the deer killed lived longer than two minutes after being hit, and that one did not last longer than three minutes. I do believe very strongly the use of the muzzleloader will tend to make the hunter more careful in getting his game in range and placing the shot. After all, he has only one shot *and that one has to be good.* The hunter who has a magazine full of cartridges at his disposal may be encouraged to take doubtful shots and seriously wound an animal that may get away. No one will attempt such a trick with a flintlock.



Three-shot and five-shot 50-yard groups fired with a .45 caliber flintlock

One final caution: By no means should you take a muzzleloader into the woods unless you thoroughly understand the capabilities and limitations of the rifle. And if you do, by the shades of Simon Kenton, keep your flint sharp and your powder dry!

◆ ◆ ◆

REGISTERED .30-CALIBER TOURNAMENTS

With Springfield and Enfield rifles reaching shooters in ever-increasing quantities, interest in .30-caliber competition is certain to grow during the coming outdoor season. To keep pace with this renewed interest in the big bores for target shooting, the NRA has decided to set up a registered tournament plan for .30 caliber events, similar to those already in operation for small bore and pistol tournaments. Complete details will be carried in a forthcoming issue. At this time it can be announced that the Office of the Director of Civilian Markmanship will award qualification medals to shooters qualifying in future registered .30 caliber events. Watch for further information in The American Rifleman.

The Old Coach

SOME HINTS FOR INSTRUCTORS

IN TEACHING POSITION SHOOTING to a new shooter, the Armed Services agree that it is improper to handle the pupil in getting him into position, claiming that to do so causes him to lose some of his self-respect. If lectures and demonstrations were sufficient, we could agree with this attitude. However, with very few exceptions, we find that it is easier on both pupil and instructor for the latter to actually mold the student into the proper position. The coach should have a picture in his mind of the proper position and adapt his beginner to that picture as closely as the student's build will allow. This need not be done roughly, nor should it even be attempted until the tyro is informed of the teacher's intentions.

In the prone position it is a simple matter to move the pupil's left arm, then his right elbow, into the proper position as he looks through the sights. After this is correct, it is easy to go to his feet, place them in the proper position and straighten his body. This takes about three minutes, not the half hour it sometimes takes to "talk" a pupil into position.

There are various problems of adapting the shooter's position to his build which can be overcome simply if we use our heads and hands. First, remember that the shorter and huskier a man is, the longer his sling loop must be. It may be found that this short man cannot reach the trigger comfortably if his left hand is out to the swivel as is recommended. We have to effect a compromise by letting him lie more directly behind the rifle than normal, placing his left hand some distance behind the swivel.

If his shoulders are wide, also, he may complain that he cannot get his left elbow directly under the rifle. The only way the coach can tell if this is not the student's imagination is to try to place the elbow in position himself. The instructor will realize the student is right by the effort required to do so, and the pupil's shoulder will be so painfully stretched that he cannot stand the position for more than a minute or so. Rather than make an inquisition of what should be a sport, we may find it best to allow the elbow to swing just enough to the left to relax the strain. It would do no good to move his body to the left if he then cannot reach the trigger.

The person of average or taller physique will offer very few problems. The teacher should stand back and study his position while he is shooting, with the idea in mind of correcting his pupil now and then to conform to the accepted standards. No tyro can maintain the correct position for long until it becomes a habit through practice.

Sitting in the Army position, with feet spread apart, is fine out-of-doors where the shooter can dig his heels into the ground but it is not very steady indoors, especially on a concrete floor. We can use that position by turning the toes in a little. This will allow the student to place his feet flat on the floor or rest them on the outside edges of the shoe soles. The cross-legged position seems to suit most pupils better, but the tyro who uses it must practice at home to strengthen the inner muscles of the leg.

A pupil who cannot get into the low kneeling position the first time he tries it, with the instructor's help of course, had better use the high position. If he can get into the low position, even though he can hold it only a minute or so, a little practice will soon accustom him to it. Moving the left foot and right knee even an inch one way or the other will make a big difference in the pupil's comfort. The instructor must look for any sign of strain which shows the position is not just right for each particular student.

Naturally, the standing position is the real bugaboo for the beginner. Since he is going to have enough trouble trying to make his shots stay inside the five ring, do not complicate his efforts by having him imagine a rectangle around the bullseye while he is watching a post front sight wave wildly back and forth. As in the other positions, a little adjustment of the shooter's position by his coach is a great help.

Since expert offhand shots seldom seem to agree on just what makes them good, one comes to the conclusion that they have developed, through constant practice, an instinct which signals the trigger finger to add the proper pressure at the right time, without volition on their part. If, at any time, they interfere with that trained impulse, the result is a poor shot. Interference comes from either trying to get the shot off or trying to hold for tens instead of letting the rifle sway naturally.

The proper use of the sling can best be described to the tyro by suggesting he should feel that, if the sling broke, he would fall flat on his face.

Don't over-instruct! I have seen instructors pester the life out of their poor victims by insisting over and over again, "Hold your breath . . . Squeeze, squeeze . . . Get the right sight picture . . . Squeeze," until the shooter, through sheer desperation, gave a wild yank at the trigger. The pupil is not a moron and can remember for at least two or three minutes that he should squeeze the trigger smoothly. Correct him *after* he makes an error, not before. He cannot very well concentrate on his job of holding the right sight picture and squeezing *if the instructor distracts him* by talking. Try shooting a score under the same circumstances and you will appreciate the pupil's need of a little peace and quiet!

No matter how good an instructor is as a shooter, he should not reach the conclusion that his positions are the only correct ones. Many experts have learned to shoot without proper instruction themselves by adopting slightly unorthodox positions. Walk down the firing line at any match and look closely at those used by the top-notch shooters. Some of them look pretty bad. But an instructor shouldn't let the fact that some champions shoot from unorthodox positions be a reason for teaching one to a beginner. Instruct him in a good standard position and let him practice in that position until he can shoot good scores.

Stress to a student the value of practice. Make it clear that no amount of instruction will make him a good shot if he is not willing to shoot, shoot, and shoot.

* * *

POWDER SMOKE: THE NEWS DESK . . . READERS COMMENT

SAM KENNEDY DIES

Sam Kennedy, staunch friend, writer, organizer, and competitor of the shooting game is dead. He died at his home in Beaver Falls, Pennsylvania, on October 16, at the age of 68. He had been suffering from a spinal paralysis condition for almost a year.

Mr. Kennedy served as rifle editor of the Pittsburgh Sun-Telegraph, a Hearst newspaper, for many years and participated as a competitor in every tournament he covered for his paper. He attended all the Championships at Camp Perry, Ohio, since 1929 when he first took up shooting. He attained many shooting honors during his career and captained the International Dewar team in 1940.

A native of New Brighton, Pennsylvania, he was the son of the late Thomas L. Kennedy, one-time member of the Pennsylvania legislature. He was a graduate of Western University of Pittsburgh (now the University of Pittsburgh), where in his undergraduate days he won the Intercollegiate Fencing Championship and the Doubles Tennis Championship.

Sam Kennedy

Kennedy broke into newspaper work as city hall reporter on the old Pittsburgh Sun. Later, he was city editor of the old Chronicle-Telegraph for many years. Six years ago he was one of three reporters cited by the Pennsylvania Publishers Association for meritorious work in covering a disastrous Pennsylvania train wreck.

He was a member of the Fort Pitt Rifle Club, past president of the New Brighton Rifle Club and co-organizer of the Sheridan Rifle Club which for many years won the Pittsburgh and Suburban Rifle League.

Mr. Kennedy is survived by his wife, Helen B. Kennedy; a son, Samuel B. Kennedy, at home; a daughter, Mrs. Helen Frances Russ, of Beaver Falls, Pennsylvania; and a twin brother, William Kennedy, of North Bloomfield, Ohio.

1947 INTERNATIONAL DEWAR

The official results of the 1947 International Dewar Match that will be finally recorded in the record books are: United States, 7934; Great Britain, 7912; Canada, 7894. In the preliminary results the Canadian tally was announced at 7895 but a re-examination of the targets gave them one point less.

PROTESTS AND CHALLENGES

The new subcommittee of the Executive Committee, formed to handle all protests and challenges arising out of NRA competition, is now in operation. Organized to get prompt action on competitive matters, all of its members live in Washington or vicinity and can be convened on short notice.

The new body eliminates the necessity of calling a special meeting or awaiting the regular meetings of the entire Executive Committee, which always led to long delays.

The new sub-committee which will meet as frequently as is required consists of: Colonel Francis C. Endicott, chairman; Lieutenant General Julian C. Smith; Rear Admiral M. C. Mumma; Lieutenant Colonel Walter R. Walsh; and Mr. Frank T. Parsons, Jr.

IMPORTANT! DCM RIFLE SALES SUSPENDED

Since the announcement of the resumption of rifle sales by the Director of Civilian Marksmanship (page 41, October RIFLEMAN) orders have been flooding the DCM Office at the average rate of 1,000 a day. An "educated guess" indicates that at least 70,000 orders will have been received by the end of December. Neither the DCM nor the arsenals and depots which must inspect and ship the rifles can possibly keep abreast of such a tremendous volume of orders.

Because of this situation *the sale of rifles will be suspended on December 31. All rifle orders received by the DCM bearing a postmark later than December 31, 1947, will be returned.*

At this moment it is not possible to say how long will be required to process the orders and to inspect and ship the rifles which will have been ordered by December 31. All orders will be handled by the DCM in the sequence in which they are received. Some arsenals will, however, inspect and ship rifles more promptly than others. This will result in some purchasers receiving their rifles ahead of other purchasers whose orders were sent at an earlier date. This is unavoidable and will not mean that the DCM is "playing favorites."

It must be emphasized that there are adequate supplies of rifles on hand. Sales are being *suspended,* not discontinued. As soon as the arsenals have been able to reduce their backlog of orders to the quantity which they will be able to inspect and ship within the ensuing 30 days, an announcement will again be made resuming rifle sales. The suspension as of December 31 is solely for the purpose of avoiding the piling of unfilled orders on the desks of the DCM and arsenal officers, which would result in irritation and disappointment to members of the NRA. Please do not write and ask when your order will be shipped or when sales will be resumed. We want to keep all available personnel busy processing the accumulated orders!

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Spare Parts and Ammunition Sales Continued

The suspension of rifle sales will not affect the sales of spare parts, components, and ammunition. For the benefit of men who already have rifles, we want to help keep their guns shooting by continuing the sales of repair parts and ammunition. These orders, too, will be delayed as a result of the overloaded conditions in the DCM and arsenals. They will, however, continue to be accepted after December 31 and will be processed as rapidly as possible in the order received.

173-Grain M1 Bullets

The DCM is now prepared to accept orders for 173-grain M1 boattail bullets in lots of 1,000 (no more, no less) to each purchaser. The price is $7.25 a thousand. All shipments will be made from Savanna Ordnance Depot. These bullets have been carefully pulled from prewar ammunition ('38 and '39) which had been condemned. Some of the bullets may have imperfections. The DCM and the shooting fraternity are grateful to the Ordnance Department for their foresight and energy in making these fine bullets available.

Comply carefully and completely with the instructions for ordering from the DCM given on page 41 of the October issue of THE AMERICAN RIFLEMAN.

Club Reports and Correspondence

The Director of Civilian Marksmanship is required by law to secure *two* reports every year from *each* club carried on his rolls. These are an "Inventory of United States Property in Possession of the Club" and an "Annual Report of Firing."

Blank report forms, in duplicate, are sent to each club thirty days prior to the date the reports are due in the DCM office. A letter accompanies these report forms giving detailed instructions for filling out each report. Many clubs fail to send in their Inventory, thinking it is not required because they do not have an issue of rifles or nonexpendable property. Also, clubs which may have, for some reason, failed to fire as required, do not submit the Report of Firing. *These reports are required* and must be sent in if a club wishes to remain on the rolls of the DCM. If a club has no rifles or other nonexpendable property the word "none" may be entered in Column 4 of the Inventory. Be certain, however, to enter on the Inventory, all information requested regarding issues of ammunition, targets, and other supplies. Carelessness in entering items in the correct spaces on the Inventory, and omissions or guesswork as to the actual items on hand, multiplied by several hundred clubs, causes the DCM a huge volume of unnecessary work and delays the processing of the club's requisition and other regular work of the office.

Many clubs confuse the Annual Report of Firing, submitted on WD ODM Form 29 by senior clubs and on ODCM Form 29-A by junior clubs, with the record of qualifications made by firing one of the record courses. The report of qualifications is submitted to the DCM office on ODCM Forms 2A and 2C by senior clubs and 2B by junior clubs and may be sent in at any time during the year. These blank forms are furnished by the DCM only upon request.

(Continued on page 54)

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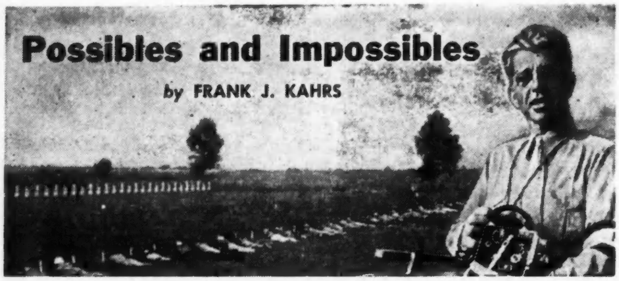
Rifle Re ton

VOL. 10, NO. 12

BRIDGEPORT, C T, DECEM



Possibles and Impossibles

by FRANK J. KAHRS

It seems incredible that another year has passed since my last annual message and greetings to my friends everywhere. I claim as friends everyone who reads the column, and, therefore, to each and every one of you this message has my personal season's greetings. I enjoy this annual opportunity to review briefly some of the things that stand out in the year's activities.

As usual, I have done a lot of traveling during the year, and some of you will recall perhaps a visit I made with you, or a shoot where we got together, and I don't mean just here in the East, either, because I covered a lot of territory this year and really got around. I recall my trip to the Coast in the Spring because it was on Easter morning that I took off from Salt Lake City, Utah, in threatening weather and headed for Billings, Montana, by way of Pocatello and Butte. What should have been about a three hour trip took 24. Somewhere over the Rockies we ran into snow, and I mean snow. We finally had to come back to Pocatello and wait for clearing weather. So, that night at midnight we took off again and this time we made it.

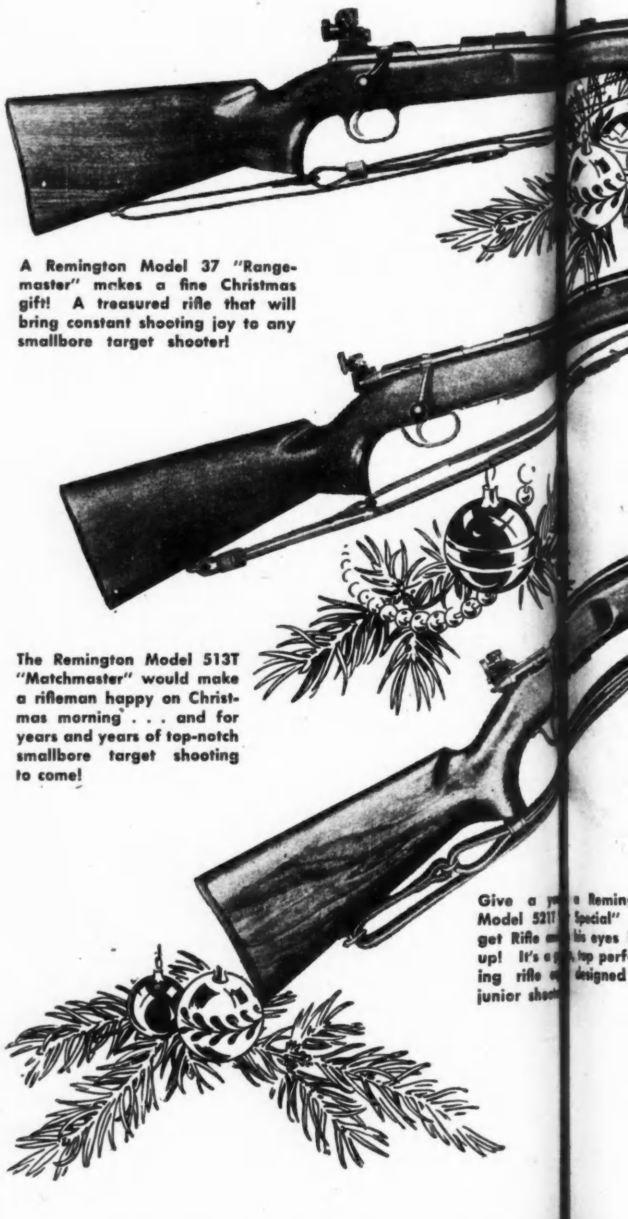
While I was wondering that Easter day whether I would ever get my feet firmly on the ground again, I had a lot to think about and still a lot more to be thankful for. I didn't know where I was going, but I was on my way. After traveling through the Northwest and down the Pacific Coast and back through the Southwest, I arrived home just in time to help open the outdoor shooting season.

It has been a grand year for shooting and we have had some good competition. A lot of new shooters have come along and added much interest to the sport. Some new ranges have been built, and more are on the way.

In my travels around the country, I am pleased to report that some of my sermons about better ranges with covered firing points, shade trees, benches, running water and other facilities have been acted upon or are in the process of making. It's a good sign and I am sure it will result in attracting both shooters and spectators to attend these shoots.

So, we close another year of rifle shooting sport with every expectation that next year will be a banner one, because we will really feel the impetus which was given to rifle shooting this year. We promise to try and cover enough territory next year to include a visit with most of you for we enjoy your friendship. We leave you with a sincere wish for a Merry Christmas and a Happy New Year and lots of good shooting sport in the future.

To make any shooter y a



A Remington Model 37 "Rangemaster" makes a fine Christmas gift! A treasured rifle that will bring constant shooting joy to any smallbore target shooter!

The Remington Model 513T "Matchmaster" would make a rifleman happy on Christmas morning . . . and for years and years of top-notch smallbore target shooting to come!

Give a y e Reming
Model 521T Special"
get Rifle his eyes
up! It's a top perf
ing rifle designed
junior shoo

HAPPY HOLI YS

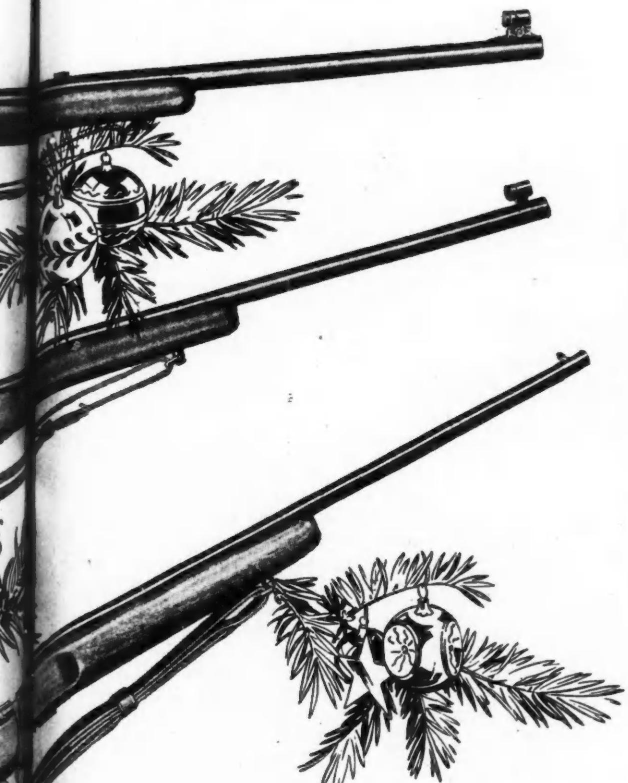
ton News

MERRY CHRISTMAS!

RT, C , DECEMBER, 1947

First Class Reading Matter for Rifle and Handgun Shooters

y at Christmas . . .



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5217 Special" Tar-
his eyes light
a top perform-
designed for

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Rangemaster, Matchmaster, Police Targetmaster, Palma, Kleanbore are Reg. U. S. Pat. Off. by Remington Arms Company., Inc., Bridgeport 2. Conn.

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22 PALMA KLEANBORE
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38 SPECIAL
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Remington KLEANBORE Ammunition

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22 LONG RIFLE LUBRICATED
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TARGETMASTER
230 GRAIN METAL CASED BULLET
45
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(Continued from page 51)

Requisition blanks are sent with the report forms. On these requisition blanks are listed items available for issue in accordance with existing regulations as outlined in Army Regulations 850-100. During the past year all enrolled clubs were furnished a current copy of this publication. Requisitions are processed as speedily as possible after the club's reports have been checked, found to be correct, and notification of its 1948 affiliation with the National Rifle Association has been received in the DCM office.

Other matters the Director of Civilian Marksmanship would like to mention: First, as in the case of annual reports, the Director is required by law to secure the *serial numbers* of all issued rifles and *signed acknowledgment* from the club of the receipt of *all* items issued to it. The hundreds of clubs which fail to comply with these requirements is almost unbelievable in view of the fact that a notice is always sent to the consignee when issues are approved, requesting him to send in the serial numbers of rifles and a signed acknowledgment of the receipt of all items of government property. Here again, a great amount of unnecessary work for the DCM is caused by carelessness or indifference on the part of the club officials since letters must be sent to each club failing to meet these requirements. Many clubs have to be written to twice and even three or four times before this information is obtained.

Second, the DCM merits a reply to correspondence from him. A club will not lose by showing him that courtesy. Keep his office current on the names and addresses of all club officials. When writing or sending in reports to the DCM, please use the correct name of your club as shown on the NRA club charter.

It is not only the duty of the Director of Civilian Marksmanship but it is his pleasure to render every assistance authorized to each club on his rolls. Your courteous and prompt compliance with regulations which he is required to enforce, is greatly appreciated by him as well as by his office staff. Will you, as a club official, do what you can to help in these matters?

T. F. WESSELS, Colonel, Infantry,
Director of Civilian Marksmanship.

TOURNAMENT SCHEDULES

An annual schedule of all registered outdoor tournaments will be published by the NRA for the first time for the 1948 season. The first of the new annual programs will be available about April 1, 1948 and will carry the firing dates of all 1948 outdoor tournaments registered by the National Rifle Association prior to March 1, 1948. Under the plan the schedules will be mailed to all classified shooters on the NRA lists and to all club secretaries.

To make the annual schedule work, clubs will have to register their tournaments early. This will work out as an advantage to the shooters. Early scheduling will avoid objectionable conflicts of dates and a longer planning period will lead to more successful matches, both from the competitors' and sponsors' point of view. With this announcement anyone planning a 1948 outdoor tournament should begin work immediately. Have everything set by March 1, 1948, and make sure that the match is included in the 1948 annual program.

State championships, Regional matches, and the National Championships will be announced in THE AMERICAN RIFLEMAN, as heretofore.

RESULTS OF SUMMER LEAGUE CHAMPIONSHIP

The second annual NRA National Summer League Championship finals were fired between September 15 and October 6 with the Linn County Rifle and Pistol Club, of the Hawkeye Conference, in Iowa, taking the rifle title, and the 12th Precinct Pistol Club, Washington, D. C., walking off with the pistol crown. The four-man Linn County team posted a winning score of 1584-85X. The Dearborn Rifle Club, of Michigan, finished second to Linn, with 1581-90X, while the Wilmo Rifle Club, of Ohio, placed third, with 1581-79X.

The 12th Precinct's winning quartet posted a score of 1114 to nose out the Federal Employees Pistol League, Denver, Colorado, by 8 points while the Capital Pistol League's Red Team, Seattle, Washington, pulled in third with an even 1100.

Thirty-three rifle and ten pistol teams, winners of their respective league crowns, fired for the national crown. The squads represented the cream of 292 teams which started the original competitions in the early summer.

Individual scores for the two champion teams were: Linn County (rifle)—Julian E. Johnston, 397-21X; Dave Rosenberg, 396-26X; R. W. Sprowls, 396-14X; and Steve West, 395-24X. 12th Precinct (pistol)—J. B. Layton, 283; C. R. Couser, 281; D. W. Manuel, 277; and J. B. Barron, 273.

NEW GALLERY RIFLE CLASSIFICATION IN EFFECT

Gallery classification cards are being mailed to each competitor who fired in 1946-47 registered gallery tournaments and leagues, provided he has a minimum of 50 shots in both the offhand and the prone positions on record. These gallery classifications will become effective immediately for registered gallery rifle tournaments.

Classification averages and subnormal scores used in computing these classifications are as follows:

Class	*Average Score*
Master	93.5 and above
Expert	90.5 to 93.49
Sharpshooter	87.5 to 90.49
Marksman First	83.5 to 87.49
Marksman	65.0 to 83.49

Class	*Subnormal Scores*	
	Prone	*Standing*
Master	Below 99	Below 86
Expert	Below 97	Below 81
Sharpshooter	Below 96	Below 75
Marksman First	Below 93	Below 69
Marksman	Below 85	Below 40

In computing the classification for each competitor, all prone and all offhand scores, exclusive of subnormal scores, were averaged separately. These two averages were combined to arrive at the final average, which determined the class. The table of classification averages is the result of a com-

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plete statistical study of actual tournament scores. The study was made in order to arrive at the proper spread for each class so that approximately the same number of shooters would be in each. Masters represent approximately the highest ten percent of all shooters.

Beginning with the 1947-48 registered gallery tournament season, gallery classification will be maintained currently in a manner similar to that used for outdoor rifle and for pistol classification. Prone and offhand scores only will be recorded on each competitor's master classification record. Normally, classification averages will be recomputed whenever 50 shots have been recorded in each position. When a shooter's average goes up into the next classification bracket he will be reclassified immediately and an official notice and new classification card will be sent to him.

For the unclassified competitor score record books are being provided, making it possible for every shooter to have at least a temporary classification at the end of his first registered tournament. These books permit a shooter's average to be computed as the scores are fired. Registered league scores also will be used for gallery classification, although not until the end of the league program. However, all registered league secretaries will be supplied with Score Record Books for the temporary classification of league shooters not already officially classified.

As in the outdoor and pistol classifications an unclassified competitor will be required to compete in the Expert class throughout his first registered gallery rifle tournament. Any competitor may at anytime elect to compete in a higher class than his own but not in a lower. Official classifications will not be revised downwards except by special appeal, as provided in NRA shooting rules.

No shooter who has a current outdoor rifle classification will be required to compete as unclassified in registered gallery rifle competition. He may compete throughout his first registered gallery tournament in his outdoor classification. It is the competitor's responsibility, however, to obtain a score record book in order to immediately establish his temporary gallery classification.

RICOCHETS

FITTINGS FOR ROWLAND RIFLES

Port Townsend, Wash.

Editor:

I am wondering if my name was deleted from article on . . . Rowland ("The Man Behind the Gun," October). . . .

I made both Ballard stocks and cast the bronze buttplates, which have soft rubber inserts (for the three rifles Hankins owns). I made the spur finger lever from blacksmith forgings, dismantled and reworked that Pope six-lever trigger, and I threaded and fitted the Schoyen barrel which was on a Hepburn frame. The Pope barrel was refitted from another action. They all seemed to work, judging from the targets shown.

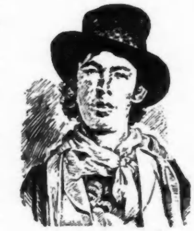
Hervey Lovell

THE KID'S DEATH

Los Angeles, Calif.

Editor:

Author Mann admits his prejudice in Billy the Kid's favor (p. 21 October Rifleman), so we know right off where he stands. But this in itself is insufficient reason to by-pass or ignore the truth in an article presented as factual.

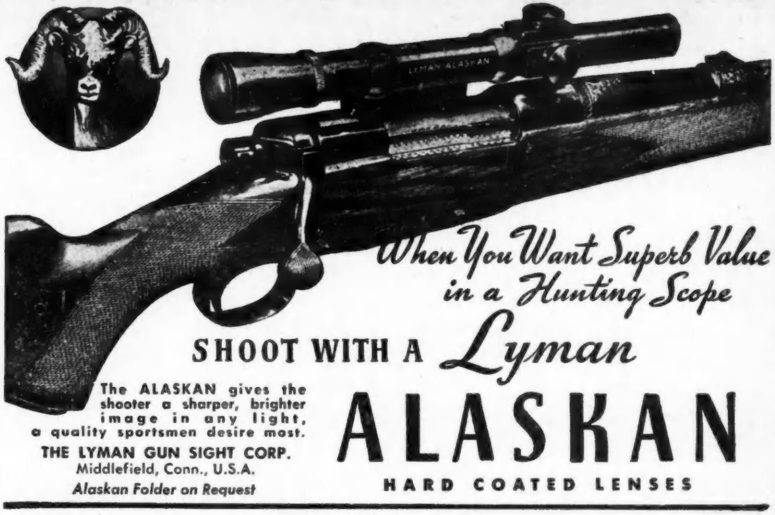


Mann states that when Garrett killed the Kid that night in Pete Maxwell's house, the Kid was unarmed, carrying only a butcher knife to cut himself a chunk of beef from Pete Maxwell's larder. The implication here is plain—that Garrett took unfair advantage of the Kid by shooting an unarmed opponent. Had this been true (that the Kid *was* unarmed) Garrett would still have been justified in shooting first, since in the darkened room he could not have seen whether the Kid was armed or not, but had to assume quite naturally that he was. The Kid was *always* armed. I'm wondering just what the hell Author Mann expected Garrett to do—call out and challenge the Kid to a duel at thirty paces?

The facts are these. The Kid *was* armed. As stated before he was always armed. He knew Garrett was fast closing in on his trail and that the thing he feared most—the showdown—must come soon. Contrary to Author Mann's statement that Garrett was 'lucky' not to have met the Kid 'in the open, armed, in equal combat,' to use the words he attributes to the Kid's 'friends' and which Mr. Mann, admitting his prejudice, apparently accepts as the truth, the situation was quite the opposite. The Kid wanted no part of Pat Garrett in any kind of a gun fight whatever. It was the one thing he was most desperately trying to avoid. He knew he could never match Garrett's high courage—nor his cool deadliness with pistol or rifle in mortal combat. This allergy of the Kid's was common knowledge to people of the period not blinded by prejudice—John Chisum, the cow baron, among others, including members of the Kid's own gang, Jesse Evans, Dave Rudabaugh, and Tom O'Folliard, who at various times had voiced such. By now Pat Garrett had tracked down and killed the last two members of the Kid's remaining gang—Charlie Bowdre and Tom O'Folliard. Yes, they had both been armed to the teeth—with pistols, knives, and Winchesters. Only the Kid himself remained—the last of his lawless group.

Now back to that night at Pete Maxwell's. The Kid had a knife all right and, as stated in Mr. Mann's article, was headed for the 'saguan' to cut himself a piece of beef. He had something else, too—a .41 double-action revolver, a 'self-cocker' as Garrett later described it, in his right hand. Hatless and in stockinged feet, he came into the darkened room. He heard low voices coming from the direction of Pete Maxwell's bed. Alert and suspicious, he called softly to Pete in Spanish, "Quen es?"—"Who is it?"

He came forward and was almost close enough for Garrett to have reached out and touched him. At that moment Maxwell whispered to Garrett, "That's him." The Kid stepped backwards. Garrett drew his pistol and fired at the moving shadow. He threw his body to one side, to avoid return fire, and



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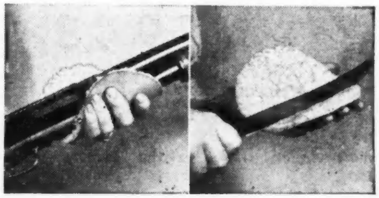

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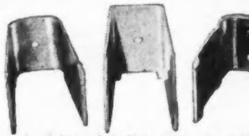

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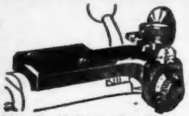
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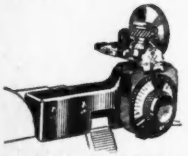
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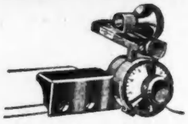
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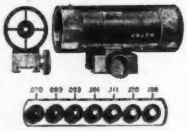

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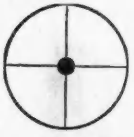

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shot again. But it wasn't necessary. The first shot had done the work. The Kid was dead.

That's the way it happened. How do I know? From Pat Garrett's own words, verified by Pete Maxwell, and John Poe and Tom McKinney, the two deputies with Pat Garrett at the time, who'd been stationed outside on the steps of the porch, while Pat, himself, went inside to question Maxwell. At the time my father, Jim Brent, was Barrett's chief deputy and had remained in Lincoln in charge of the office, while Pat, John Poe, and Tom McKinney took up the Kid's trail. Pat Garrett told the story to my father upon his return to Lincoln. Pat Garrett was a man of truth and integrity. He would not have drawn the long bow about a thing like that, even had he been so inclined.

WILLIAM BRENT

COMING EVENTS

The four classes of registered tournaments are indicated as follows:
AA—National Matches.
A—Regional Tournaments.
B—State Championship or large district matches.
C—Local Tournaments.
Un—Indicates tournaments that are not registered.

Tournaments requiring Advance Entries are indicated by **Adv.** and tournaments that plan to limit the entries to a predetermined number are indicated by **Ltd.**

DECEMBER

6, 7, Iowa (C)—Fall Indoor Small Bore. Howard O. Smith, Box 1395, Des Moines.
7, California (Un)—Oakland Pistol Matches. J. H. Valerga, Jr., 3800 Cerrito Ave., Oakland, 11.
7, Wisconsin (C)—Third Annual Gallery Rifle, Milwaukee. Betty Wiest, 220 N. East Street, Menomonee Falls.
7, Arizona (C)—Arizona Sectional Pistol, Tucson. Mack Weiss, Box 1024, Prescott.
7, Oregon (C)—First Annual Gallery Rifle Tournament, Hillsboro. Albert P. Tauscher, 1849 S. W. Salmon St., Portland 7.
7, California (Un)—Southland Pistol Match. R. S. Pease, Police Range, 40th & A Sts., San Diego, 2.
Tournament. Edward A. G. Wylie, 12 Beekman
13-14, New York (C)—Winter Gallery Rifle
Place, New York, 22.
21, California (C)—San Francisco Police Monthly Pistol, Lake Merced. Emile J. Dutil, 324 16th Ave., San Francisco, 18.

JANUARY

3-4, New Jersey (Un)—Ninth Annual Presidents Match, Union City. Walter J. Tanner, 119 Hobart St., Ridgefield Park.
11, Washington, D. C. (C)—Monthly Gallery Pistol Tournament. R. G. Arnold, 5308 41st Place, Hyattsville, Md.

STOLEN GUNS

One Model 37 Remington Rangemaster, No. 02593, no sights, factory stock remodeled with cheekpiece and removable comb. Leonard Morton, 1121 South Fourth St., Louisville 3, Kentucky.

One .38-44 S&W Outdoorsman Target, 6½ inch barrel, No. 69747. Bruce G. Ward, 1497 Highland, Needles, California.

A .45 caliber Colt service pistol Model 1911-A, No. 705405. Lt. Col. Harry Larson, 1407 Second Ave. North, Fort Dodge, Iowa.

H&R Pistol, .22 caliber, No. 1904730; .45 New Service Colt, No. 324085; 12 gauge Remington Auto Model 11 Shotgun Cutts Comp., 366660; 12 gauge Ithaca Pump shotgun Model 37, IX Weaver shotgun scope with Cutts Comp. and fancy walnut stock (J. D. Bates); .30-'06 Springfield with 4X Noske scope, No. 796754; 7 mm. Mauser Springfield Action with K4 scope, No. 7128232; .257 Roberts Springfield action, Rock Island, fancy Mesquite stock (J. D. Bates) Alaskan scope, No. 429849; .30-'06 C.C.C. Springfield Action K2.5 scope, No. 774927; .300 Savage Springfield Action K4 scope, No. 718744; .250-3000 Springfield action K2.5 scope, No. 722218; .257 Roberts Springfield Action K4 scope, No. 774380; .270 Weatherby Mag. Springfield Action, Alaskan scope, No. 1182816; .270 Winchester Springfield action, Rock Island, K2.5 scope, No. 719289; .220 Swift Springfield Action, No. 197963, 10X Unertl scope, fancy walnut stock; .220 Weatherby Rocket heavy barrel, Springfield action, No. 759405, K4 scope with Varmint Master Att.; .22-250 Varminter heavy barrel, Springfield action, No. 783437, 10X Unertl scope; .257 Ackley Mag. Springfield action, No. 3818164, Alaskan scope, Varmint Master Att.; fancy Mesquite stock (J. D. Bates); .22 caliber Auto Sporter German Walther, No. 31766, 330 Weaver scope; .22 caliber target rifle, German Walther, No. 13480, 10X Fecker scope, fancy walnut stock; .22-3000 Lovell Springfield action, No. 211, Alaskan scope with Varmint Master Att., Fancy walnut stock (J. D. Bates); .30-'06 Mauser Action, No. 7720 K4 scope, fancy walnut stock; .22-3000 Lovell Winchester H.S., single-shot action, No. 203, 10X Unertl scope, fancy walnut stock; .270 Winchester Springfield action, No. 430558 Noske 4X scope, fancy Mesquite stock (J. D. Bates); .270 Ackley Mag. Enfield action, No. 351091 Alaskan scope with Varmint Master Att., fancy Mesquite stock (J. D. Bates); .22-250 Varminter Mauser Action, No. 1378, 10X Unertl scope, fancy walnut stock. Allen Timney, 518 Linden St., Bellflower, Calif.

One Winchester Rifle, Model 70, No. 18058, .30-'06, 24-inch barrel, W.J.S. 48, in lengthened leather scabbard. Liberal reward. C. V. Clapp, 1623 Gaylord St., Denver 6, Colo.

One Ithaca, 12 gauge pump, Model 37 Standard, 28-inch barrel with Poly Choke attached, No. 97303. Reward of $25.00 offered. Lawrence J. Clarke, 2424 Lake View Avenue, Los Angeles 26, Calif.

One .38-44 Smith & Wesson, heavy duty revolver, blued, 4-inch barrel, No. 66707. A. Bernhart, 221 Warrington Drive, New Orleans 19, La.

STATEMENT OF THE OWNERSHIP MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933, AND JULY 2, 1946.

Of The American Rifleman, published monthly at Washington, D. C., for October, 1947.

District of Columbia, ss:

Before me, a notary public, in and for the State and county aforesaid, personally appeared C. B. Lister, who, having been duly sworn according to law, deposes and says that he is the Editor of The American Rifleman, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: National Rifle Association of America, 1600 Rhode Island Ave., Washington 6, D. C.

Editor: C. B. Lister, 1600 Rhode Island Ave., Washington 6, D. C.

Managing Editor: John Scofield, 1600 Rhode Island Ave., Washington 6, D. C.

Business Managers: Executive Committee, National Rifle Association of America, 1600 Rhode Island Ave., Washington 6, D. C.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

National Rifle Association of America, 1600 Rhode Island Ave., Washington 6, D. C. No stockholders.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is . . . (This information is required from daily publications only.)

C. B. Lister, *Editor*.

Sworn to and subscribed before me this 1st day of October, 1947.

Louis Q. Bradley,
(seal) *Notary Public*.
My commission expires May 14, 1951.

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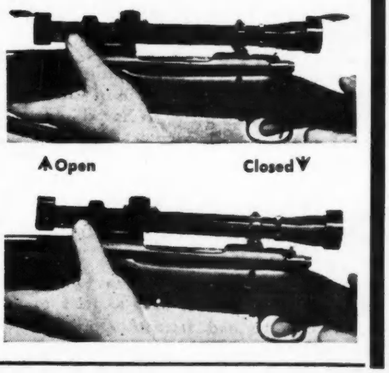

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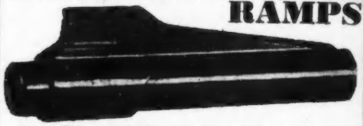

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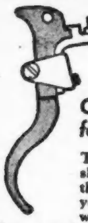

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6.5 MM. MANNLICHER AMMO AVAILABLE

The 6.5 mm. Mannlicher cartridge together with several other hard-to-get foreign numbers can be had from Abercrombie & Fitch, Madison Avenue and 45th Street, New York 17, N. Y. These cartridges are being imported from Imperial Chemical Industries, Ltd., of Great Britain and can be expected to be of excellent quality.

The first shipment of the 6.5 mm. Mannlicher was due in November and should be on hand now. When we last talked to Abercrombie & Fitch on the subject, they expected the cartridges to cost about $4.00 per box of 20, though this is not a quotation of the price. The exact figure will not be known until the invoices arrive.

Among other scarce numbers which will be for sale by this firm are the 6.5 x 53R (a rimmed cartridge similar to the 6.5 mm. Mannlicher which is quite popular in three-barrel German guns), the 9 mm. Mauser, and the 9 mm. Mannlicher-Schoenaurer.

—J. S. H.

UNERTL VARMINT SCOPE

We recently received John Unertl's version of what he figures the varmint shooter wants in the way of a rifle scope. The one we have been putting through the paces is 6X but Unertl is also making it in 8X.

Our 6X is one of the most beautiful scopes, optically, that I have had the pleasure of looking through; it is sharp to the very edge of the field. I mounted it on a Winchester Model 70 chambered for the .220 Swift and found shooting with it a distinct pleasure.

The scope has external windage and elevation adjustments in the new Unertl "dehorned mounts." Knurled adjustment nuts are inside of the mount frame but protrude, beyond the sides of the frame, enough to permit turning with thumb and forefinger. These adjustment nuts can be locked in place by hexagon nuts on the outside of the frame. For your information, these lock nuts have left-hand threads; I nearly sprained a thumb on them before I discovered this arrangement.

The clicks in the adjustments are ¼ minute when the mounting bases are about 8 inches apart. On the Model 70 I mounted them closer to take advantage of the holes in the receiver ring and the dove-tail cut in the barrel. This placed the scope blocks exactly 5 inches apart. With this shortened mount radius, one click moved the point of impact .42 minute or about .42 inch at 100 yards.

The optical axis of this scope when mounted on the Model 70 is 1.70 inches above the center line of the bore. The eye relief on the Unertl 6X is not critical but is optimum at about 2.8 inches. This puts the scope far enough ahead of the eye so that you need not worry about recoil.

In either 6X or 8X this scope has plenty of light. Our 6X has an exit pupil diameter of about 4.5 mm.

Vital statistics concerning the 6X scope are as follows:

Length—19½ inches
Outside diameter of eyepiece sleeve—1.25 inches
Outside diameter of objective sleeve—1.50 inches
Tube diameter—.875 inch
Exit pupil diameter—4.5 mm.
Field of view at 100 yards—15.85 feet
Magnification—5 (approximate)
Lenses—coated
Retail price—$75.00

—E. B.

WEAVER G-4 SCOPE

Weaver, that prolific producer of scope sights, is now appearing on the market with a new hunting scope for rifles having light recoil. Light recoil rifles include those in the .22 Hornet and .25-20 class. The scope has been designated the G-4. I have mounted one on a Remington Model 510P .22 caliber rifle and it makes a very satisfactory combination. After sighting in I was able to place most of my shots in the ten ring at 100 yards.

John Unertl's new varmint scope is made in 6X and 8X. (Inset) Knurled adjustment knobs on the inside of the mount frame are locked by turning the hexagonal knobs on outside

New Weaver scope for rifles of light recoil

The internal adjustments are not the click type but seem to be very positive. Adjustments on a hunting scope of this kind are mainly for sighting-in, and not making the fine corrections as are necessary with the target scope. I have found a place on the graduations, however, which will move me the required amount to allow for the difference in elevation required when changing from regular velocity ammunition to the high speed variety.

For mounting the scope I used the N3 low-position mount. The N type mount is furnished with the scope. The type Q top or side mounts can be had but there is an extra charge for these. However, for ordinary use the N type mounts are rigid and plenty good enough. If you intend to put the scope on a high priced rifle, then it would be appropriate to go in for a mount with more of a quality appearance.

The scope is 11½ inches long, has a tube diameter of about .755 inch and an eyepiece diameter of .820 inch. The eye relief is 1¾ inches and the exit pupil diameter 2½ mm. The cost of the G-4 including mounts is $9.75.—E. B.

SATURN "SCOUT" SPOTTING SCOPE

Competition in the spotting scope field is getting keener all the time. Tinsley Laboratories, well-known producers of the big star-gazing jobs, has come out with a new low-priced spotting scope that is worth some serious consideration.

I have tried the scope and it is an excellent buy at $25.00. I have been out on the range with it on dark, cloudy days, as well as bright ones, and have always managed to spot .22 bullet holes at 100 yards with ease.

The "Scout," of draw tube construction, is mechanically very smooth and easy to focus. The objective lens measures approximately 43 mm. in diameter, which is larger than other spotting scopes in the low-priced field. The larger objective lens makes possible increased light gathering providing the optics are good, and the scope which we have appears to be very good optically.

The balsam used in cementing the objective lens in some of the first scopes produced had a tendency to break free. This does not seriously impair the use of the scope but where the defect is present it can be easily detected by looking directly at the objective lens. If the balsam has given way, there will be a blurred section or what might appear as a bubble-like formation in the lens.

The company informs us that this condition has been corrected and the last "Scout" we have seen appears to be excellent in every respect.

Facts about the "Scout":

Weight—1 pound 6½ ounces
Length (closed with caps)—13 inches
Length (extended)—17 inches
Tube diameter—2.00 inches
Magnification—20 (specified)
Diameter of objective lens—43 mm.
Diameter of exit pupil—2 mm.
Eye relief—.5 inch
Lenses—coated
Retail price—$25.00 —E. B.

REMOVING PARALLAX

I have a Lyman Alaskan with a Litschert 8X attachment mounted on a Varminter. The scope has parallax and I want to know how to get it out.

When I set the attachment for 100 yards and shoot at that range, I have at least two inches of parallax. It is now set for 300 yards and has much less parallax, but still enough so that the gun shoots more like a .30-30 than a Varminter.

Is there something mysterious about parallax? No one seems to know anything about it.—HOMER R. COSS, Pontiac, Mich.

Answer: I note you say your Lyman Alaskan with Litschert attachment is set at 100 yards and has parallax. It is not accurately adjusted for that range if you note parallax.

First, adjust the eyepiece so the crosshairs are perfectly clear and black. In doing so, keep the eyepiece as far back as possible while still retaining a clear image of the crosshairs. This position will result in minimum eye strain. Then focus the front end until all parallax is removed.

Forget any markings or readings on the adjustment sleeve of the scope itself, focusing the scope by moving the threaded sleeve holding the objective lens until parallax is completely eliminated. Do not rely on the graduated lines which indicate yards of range. Usually they mean nothing, and that is what has made focusing complicated for you.

There is nothing complicated about removing parallax. Just keep moving the objective forward or backward until the crosshairs remain stationary. That is all there is to it. —A. H. B.

SINGLE SET TRIGGER

G & M Industries, Engineering Division, 139 W. Norman Ave., Dayton 5, Ohio, make single set triggers for bolt-action rifles, including the Enfield, Mauser, Winchester Model 70, Springfield, and Krag. We fitted one to the M1917 Enfield following instructions furnished by the manufacturer. Some filing and fitting was necessary, but when following instructions the task is not too great for the average gunsmith.

A clean single set trigger is possible when properly assembled in the standard trigger guard.— A. H. B.

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Mossberg Spotting Scope, coated lens	22.30
Bausch & Lomb Draw type, coated lens	40.00
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Parker-Hale .22 Caliber Rifle Rods	3.50
Parker-Hale .30 Caliber Rifle Rods	4.00
Parker-Hale Shot Gun Rods	4.00
10-X Shooting Coats, Imperial Model	13.00
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.22 Caliber Long Rifle Cartridges, regular and match brands, all fresh stock	

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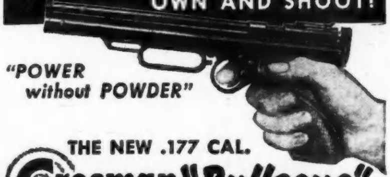

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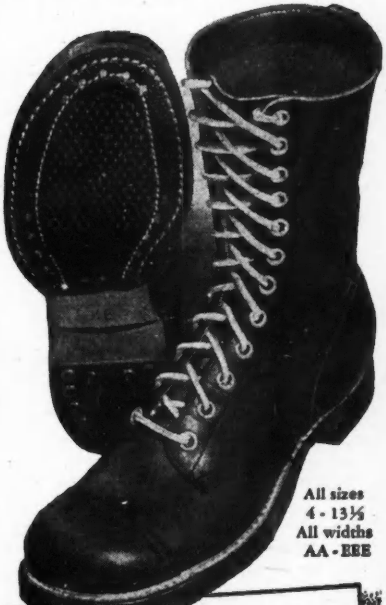

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LIKES THE IMPROVED ZIPPER

I have had the opportunity to give my Hervey Lovell Improved Zipper the works. Shooting 33 grains of No. 4064 and 55 grain 8-S bullets with Winchester No. 115 primers (no wads) in formed cases, ten groups of five shots each at 100 yards averaged under one inch. I have two five-shot groups that I will not show, being afraid I might be called a liar.

This little case is the most flexible of any I have tried. Fire-forming several factory ones with 27 grains of No. 3031, bullets just about stayed in a 1¼ inch group. With 31 grains of No. 3031, a 55 grain 8-S bullet, and No. 115 primers, the five-shot groups average about ¼ inch larger at 100 yards.

A Varminter will just wade through a large square of ½ inch cold rolled steel, but this case will penetrate it at 50 yards, which is one for the records.

When shooting at spots on rocks about 350 to 400 yards away, the Improved Zipper shows no more drop than my Rocket with 39 grains of No. 4064 powder and 55 grain 8-S bullet. Both guns are sighted one inch high at 100 yards with 10X target scopes. The Rocket, with 42 grains of No. 4064 and the 55 grain 8-S bullet, shows less drop, but with 39 grains I cannot tell any difference.—HAROLD W. VAUGHN, Glouster, Ohio.

Answer: Even when the Zipper case was first developed, we felt it was of about the right capacity for a good cartridge. However, accuracy was a bit disappointing but is not with the Improved version. I am going to have one of those rifles myself because I believe the load for it, with the case practically full of powder, is such an efficient one and gives such good accuracy that it would take a long time to find another cartridge to beat it. I really do not believe your Donaldson-Wasp is going to prove at all superior to your Improved Zipper.—A. H. B.

VARD SPOTTING SCOPE

Shooters, particularly match shooters, are always trying to get the best scope optically so that every bullet hole in the target can be spotted. Some willingly carry heavy, bulky scopes in order to get the necessary definition for their purpose. The new Vard Spotting Scope, distributed by Pachmayr Gun Works of Los Angeles, Calif., is both large and bulky and gives good definition.

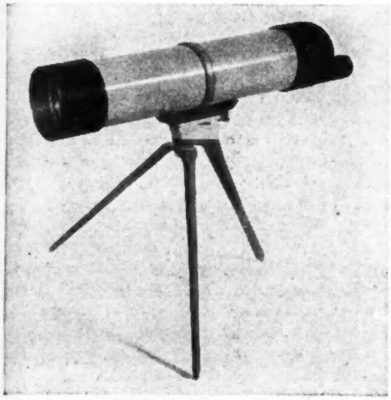
This scope is an enormous thing in size, yet relatively light, weighing only three pounds compared to four pounds for the 65 mm. Bausch & Lomb. The latter with lens covers weighs four and one-half pounds. There are no covers for the Vard, as it comes packed in a custom-made box (23 x 6¾ x 4¾ inches) which also holds two extra eyepieces and the scope stand.

The scope is 22½ inches long and maximum outside diameter is 3¾ inches. The light weight of this very large scope is possible because of its design and construction. The objective lens (3 inches or 75 mm. clear objective) is retained in a heavy metal unit which is threaded to a thinner body section. The same is true for the prismatic and eyepiece section. These two sections have the conventional black crinkle finish.

The body part is really nothing but a spacer for the two lens units. The finish is smooth and light grey in color. With both ends removed the body, which is 1/16 inch thick metal, 3½ inches in diameter and 14 inches long, resembles a section of stovepipe with a diaphragm near one end. It weighs only one pound.

Although the lenses are not coated, the optics are very good. The scope was compared with the excellent 65 mm. B. & L. many times in varying light conditions and there was not a single instance where the Vard was not noticeably better. The old 65 mm. B. & L. which we have had for nine years has only the 27X coated eyepiece and has been equalled but never surpassed in definition and resolving power before by any conventional spotting scope. It has been compared with dozens of them.

A 30X eyepiece is used in the Vard. On one occasion, when conditions were extremely bad, the Vard was the only scope on the line that would pick up .22 bullet holes at 100 yards. It did fail along with other scopes at 200 yards when a heavy mirage was running. The two extra eyepieces are 12X and 20X.


Vard spotting scope

The scope stand, which folds into a compact bundle, has a removable V-bed that stays on the scope. Apparently this stand is based on the design of the "Scope Pointer" made some years ago by Jack Weaver of Flint, Michigan. Once the scope is pointed approximately at the target, refined adjustment is made, both vertically and horizontally, by turning knurled sections which are a part of the back leg.—A. H. B.

SUGGESTIONS ON REBLUING

What causes the brown rust to form on some gun barrels after taking them from the bluing tank and running water over them? What should I do when this happens, other than to repolish the barrel and start over. I do my bluing by the method suggested in Al Barr's "Home Workshop Bluing" (page 26, September, 1946, RIFLEMAN). This method is very satisfactory, except that every once in a while I wind up with nothing but brown rust.—JOHN T. WAMBLE, Winslow, Arizona.

Answer: When a red rust forms over the blued surface of a gun after using the lye and nitrate solution, the temperature of the solution is too high. You must add more water to the solution to lower it.

I have found through experience that the temperature of the solution must be down to 285 degrees or below before the polished parts are put in. When the temperature is

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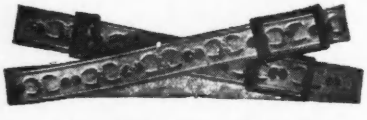

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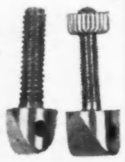

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too high a rust forms on the steel which must be removed with very fine steel wool as water runs over the blued parts, otherwise a complete repolishing and rebluing job is necessary.

If the temperature is down to less than 285 degrees when the pieces are put in the solution and red rust still forms, that means the temperature is still higher than necessary.

I understand the chemically pure form of sodium nitrate is more powerful than the commercial form which I have always used. If you are using it, reduce the proportions, and use only half as much nitrate as was recommended in the formula to which you refer.— A. H. B.

WILSON CHECKERING TOOLS

In the past year we have seen and tried a number of good checkering tools. The latest to be used is a set of four made by Wilson Industries, Inc., 250 Hempstead Ave., West Hempstead, N. Y. The set consists of one spacer, one border, and two V tools. The entire set is well-made with clean, sharp, and hardened cutting edges. The handles are somewhat larger than those furnished with most checkering tools, but they can easily be dressed down to a smaller size.

The Wilson Industries, Inc., can be complimented on the rather complete "Checkering Instructions" which have been prepared for the amateur. There are 3¼ full typewritten pages, a drawing of a checkering cradle with measurements, illustrations of a checkered stock, a layout pattern, and a suggestion on the correct diamond dimensions. These instructions are well worth reading by anyone not already familiar with the art of checkering gunstocks.—A. H. B.

"POWDER RING" IN BARREL

A friend of mine had a rather peculiar accident with his .22 caliber rifle this past winter. I am writing you for a little light on the affair. He had rigged up an indoor range in a cellar and was enjoying a little target practice, using a good standard make of ammunition of the medium velocity loading. He had fired a number of shots when one cartridge let loose and blew gas and fire back in his face. Thinking it was just a defective shell he fired it again and the same thing happened. Then he found the two fired shells and both had the heads blown nearly off. He also found his rifle had a nice ring about three inches long near the center of the barrel.

The rifle was returned to the factory and a new barrel installed. The company said they found a "powder ring" in the barrel caused by using faulty ammunition. They also advised him to try another lot of ammunition or change his brand.

Now then, just what is a powder ring and what causes it? The ammunition used was an old standard make, a brand that I have always considered as good as any.

I have two .22 caliber rifles of my own that I think a lot of. How the devil can I tell whether I am getting good ammunition or something that will ruin the barrels?—William Hodges, Marshall, Michigan.

Answer: What undoubtedly happened was that one cartridge did not have enough powder to force the bullet all the way through the barrel and the bullet stuck somewhere near the center. The next cartridge fired probably lodged its bullet right against the first one and the second cartridge fired probably blew them both out of the barrel, causing a ring or bulge in the barrel which was described to you as a "powder ring" although this term is not often used to describe the above mentioned difficulty.

As you know the manufacture of ammunition for commercial purposes practically ceased during the war and a lot of old or doubtful quality ammunition came to light. Also, the manufacture of ammunition like everything else, was to some extent necessarily entrusted to new and unskilled help. As a result there was more or less of an epidemic of stuck bullets from .22's at just about the end of the war. With the advent of new and fresh ammunition on the market, this difficulty is now disappearing.

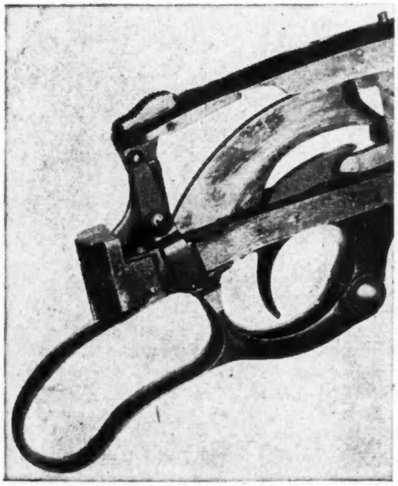
The way to avoid any trouble of this kind or any danger of ruining your barrel is to be quite sure when you fire that the bullet actually strikes the target or at least that it actually leaves the barrel.

When using fresh or recently manufactured ammunition there is very little danger of having such incident occur.—A. H. B.

TANG SAFETY FOR THE MODEL 99 SAVAGE

The left-handed shooter usually prefers a slide-action or lever-action hunting rifle to a bolt-action. In spite of this, the manufacturers of one of the most popular lever-actions, the Model 99 Savage, never considered the southpaw when designing the safety for their rifle. A tang safety would be much more convenient on it.

For that reason many Model 99 owners might be interested in the shotgun-type tang safety made by Sports Equipment Co., 345 Pine Street, Lockport, N. Y. A rifle equipped with their "Thumbsafe" was sent in by Mr. Bistoff of Sports Equipment. This cleverly designed safety works very well indeed, locking the trigger and finger lever in the same manner as the original safety. In fact, "Thumbsafe" is connected directly to the original thumb piece.



"Thumbsafe" on Savage Model 99

Apparently the biggest task in fitting one of these to a Model 99 is to make the shaped

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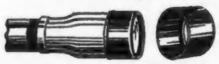

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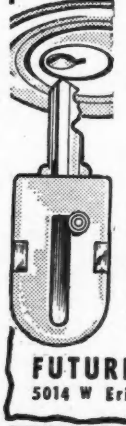

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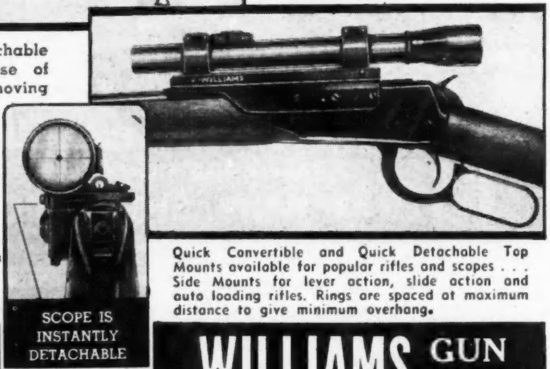

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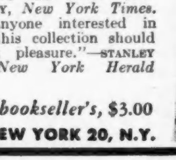

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and fitted top tang extension of 1¼ inches on which the new safety slide rests. This slide is connected to part of the original safety.

The "Thumbsafe" certainly can be recommended for the Model 99 rifle.—A. H. B.

FULL CHARGES FOLLOWING LIGHT LOADS

An article appearing in THE RIFLEMAN recently stated that in reloading, full power loads should not be used in cases that have been fired with reduced loads. I am unable to figure out why? Will you please enlighten me as I am guilty of having done this without any serious results.—MR. ALFRED H. LACY, Los Angeles, Calif.

Answer: I believe that the article to which you refer is "Some Notes on Reloading" by H. Guy Loverin which appeared on page 13 of THE AMERICAN RIFLEMAN for May, 1947. In this article, Mr. Loverin explains very clearly just what happens, the reason for it, and the remedy.

Some of our very strong modern primers are capable of developing pressures of several thousand pounds per square inch even without any powder in the cartridge case. If a primed cartridge case is fired with no powder in it the pressure generated by the primer acting in the primer pocket drives the cartridge case forward enough to resize the shoulder of the case; at the same time the primer blows partly out as the case moves forward.

Now if you have a case full of powder, the rearward pressure of the powder inside the cartridge case more than balances the forward pressure of the primer acting in the primer pocket and the action described above does not take place. However, when using very light loads a point may be reached where the forward drive of the primer in the primer pocket may over-balance the rearward push of the light load on the inside of the cartridge head.

When this happens it can be detected by the fact that the primer is partly blown out of the case. Such cases will have the shoulder pushed back, therefore when they are again used the result is the same as excess headspace.

Obviously this effect does not always occur. It only occurs when the load of powder is too light to over-balance the forward push of the primer. Unless your primers were driven slightly out of the case, the action described above did not happen and you are safe in going ahead and using these cases later for high pressure loads.—J. S. H.

CLEANING PATCHES SHOW BLACK STAIN

I clean my rifle throughly with hot water and soap after shooting regular government ammunition with corrosive primers, but I can never get the "black stuff" out entirely. The more patches I use, the more "black stuff" comes out. Some one tells me to keep doing this for three or four days and I'll eliminate it.

What would you suggest? I would like to get all this out of the barrel at the first thorough cleaning. Others tell me that the longer the rifle stands, the more black you can get out of it.—CHARLES E. COLBY, Moorhead, Minn.

Answer: Do not worry about that black stain on your cleaning patches. It is a very common occurrence and does not mean a thing. It is almost impossible to keep on running clean patches through a steel bore until they come through with no stain whatever, as some of the steel seems to rub off on the patch no matter what you do.

After shooting loads with chlorate primers, run hot water through your barrel. Then dry the bore thoroughly by running through several patches, until they come out dry. After that saturate a patch with a nitro-solvent or bore cleaner and run it through the gun. If you are going to use the gun again in a few days, that is all that is necessary. If it is going to stand any length of time, run a couple of dry patches through it, then saturate a patch with Rig or some other gun grease to put a light coating of grease in the bore. This will keep it free from corrosion for an indefinite period of time. —J. S. H.

.250 O'NEIL MAGNUM

An illustration of a .30 Newton case necked to .25 caliber, on page 16 of the August RIFLEMAN, is called the .250 O'Neil Magnum. This is not the O'Neil Magnum, but "The .250 X." The .250 O'Neil Magnum was made from a .275 H & H Magnum case using the original shoulder and various bullets, some of which were specially made in 70 and 78 grain weights to give over 4000 feet per second velocity.

I discontinued making the .250 Magnum in 1937 because of its poor showing as a deer killer and because so many people wanted guns in this caliber as large game rifles. I haven't made any in .25 caliber since, although I have made a limited number in 6.5 mm. as one could obtain up to 160 grain weight bullets in this caliber. I found a bullet of at least 150 grains better than any lighter one for deer shooting.

As to caliber, except a .22, I've come to prefer none smaller than 7 mm. for a general purpose rifle. The regular 7x57 mm. is an excellent chuck and varmint caliber loaded to 2800 or 3000 feet per second with 110 grain W.T.&C.W. bullets. As a varmint gun, the 7 mm. can take on any of them. Accuracy is excellent even in a light 22 inch barrel. There is a splendid assortment of bullets up to 195 grains to choose from, with the 139 grain a honey for open country running shots.

The 7 mm. 175 grain bullet needs no alibis as a deer load. It is not too easily deflected by twigs and gives excellent penetration on angle shots. Its accuracy is excellent and its performance over all ranges is more uniform than that of light high-velocity bullets, resulting in fewer unaccountable shots. The recoil from it is light and the life of a 7 mm. barrel is longer than with any smaller bore.

Moreover the large bores have advantages in bullet uniformity since defects will average about as much in small bullets as in larger ones—I would say a .003 inch variation on bases and corners. But the effect of a .003 inch variation is much less on a large bullet than on a small one.

Then there's the old, old argument about velocity versus killing power. Here, where deer are plentiful and hunters more so, the high-velocity calibers don't show up as well as bullets with more lead and less velocity.—CHARLES M. O'NEIL, Menahga, Minn.

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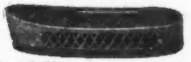

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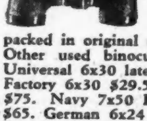

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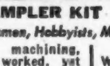

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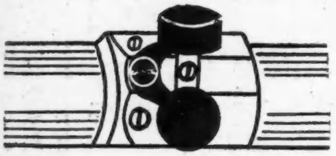

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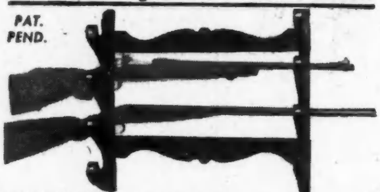

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The ramp bands are graduated in .005-inch steps from .600- to .650-inch diameter. Barrel diameter at the point where the band is to be fitted must be given when ordering the sight. A plain post sight similar to the Redfield, but without bead, can be furnished in heights of 3/16, ¼, and 5/16 inch.

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The McKenzie Gun Shop, 9530 S.E. Stark St., Portland, Oregon, makes neat ramps for front sights which are intended to be sweated in place, as they are supplied without a band to go around the barrel. These ramps are made in different heights and for appearance the length is in correct proportion to the height. A standard ⅜-inch dovetail is cut in the top of the ramps so that most any type post or bead sight can be fitted.

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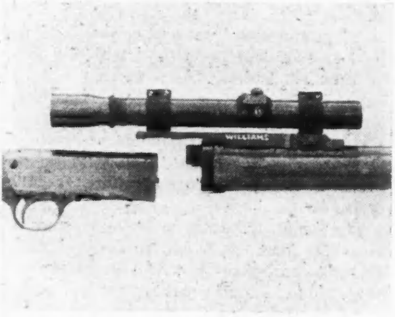
C. C. Johnson, that well-known gunsmith formerly of Thackery, Ohio, writes that he has moved to Springfield, Ohio, Route 2. Johnson indicates that he is still so far behind on his gunsmithing work that he cannot accept new orders at the present time.

☆ ☆ ☆

The Williams Gun Shop is showing new adaptations of their hunting scope mounts for various rifles. One of the most interesting is that on a Remington Model 241 "take-down." The Williams mount makes it possible to disassemble the rifle for cleaning from the breech without touching the scope and mount assembly. Williams also has special mount adaptations for the Winchester Model 64, Remington Model 81, and others.

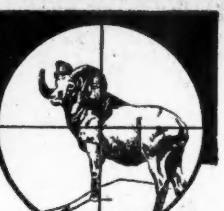


New Williams scope for "take-down" rifle

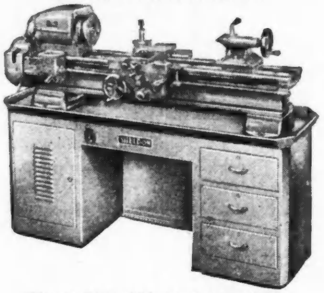
☆ ☆ ☆

John R. Speer, 7428 Richland Manor Dr., Pittsburgh 8, Pa., makes a double, forward, set-trigger assembly for Mauser, Enfield and Springfield rifles. In the unit the set trigger is reversed and positioned in the forward part of the trigger guard. The cost is reasonable and installation instructions do not sound too complicated.

BOB BROWNELL'S
GUNSMITH'S SPECIALS

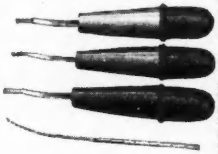


GUNSMITH DREAM LATHE



Model TRB S56, as shown $1,000
Other models from $450.00 on up.

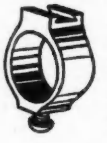
GUNSMITH CHECKERING TOOLS
"GUN LINE"



We tried out several different makes of checkering tools before we settled on "GUN LINE" products. To us they seem tops. Large, brightly colored handles, excellent workmanship . . . really precision tools. **SUPER SET:** 16, 18, 20 lines, V Edger, Bent needle file, instructions. Complete.........$7.00

STANDARD SET: One checkering tool, specify No. lines, 1 V Edger, Border VEX and Bent needle file......$4.50

DOVE TAIL BANDS

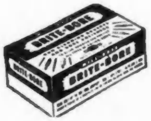


Many of heavy steel, thick sidewalls that will stand expansion. 25-32" inside diameter. Will peen and ream larger. Each..........$3.50

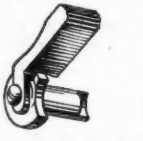
Gunsmith Discounts on 3 or more (Available in 3 different I.D. after Dec. 15th).

BRIGHT BORE

Again we have hit the jackpot. Distributors for **MILL ROSE** Brushes and Cleaning Rods. .22 rods....$1.00; Combination rifle and pistol....$1.25. .30 cal. rifle rods....$1.00; Combination rifle and pistol....$1.25. Shotgun rods, complete...$1.50. And a **FULL LINE** of brushes and bore polishers. Full dealer discount to gunsmiths and clubs. Rush in your order.

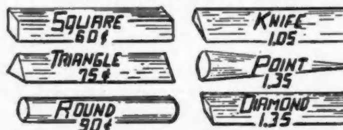


THE BUEHLER LO MOUNT SAFETY



This is the safety that does the trick. Sturdy, low, attractive. Each.....$6.00. Regular Gunsmith Discounts on Three or more Buehler Safetys.

ARKANSAS OILSTONES



Set of NINE stones..............................$7.30
(value if bought individually $9.03)

WHITE-LINE

Yes, boys, we're distributors for the best of them all: **WHITE-LINE.** Get your orders in to us. We've got 'em in stock for **IMMEDIATE DELIVERY.** Retail price $3.25. Regular discounts on gunsmith orders.

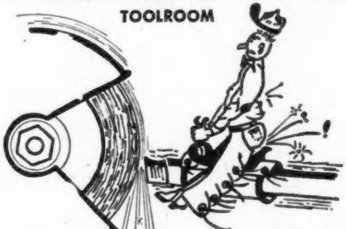
CLEVELAND DRILLS

8 fractional sizes in NEW plastic container—for everyone who uses drills. Set #26, Carbon steel drills in sizes from 1-16" to 9-32" by 32nds" $1.90

High Speed Drill set #57. Same size as above but giving you more holes per grind $3.55

No. 28 Hi-Speed drills, dozen $1.90
No. 31 Hi-Speed drills, dozen 2.04

TOOLROOM



COWBOY

Take the bronc out of your grinder—true wheels from the wildest mustangs with a Brownell W. A. tool.

FREEHAND DIAMOND DRESSERS

Each tool is guaranteed to have a genuine West African diamond with at least two points to facilitate future economical re-setting. Knurled handles are of 4" tool steel. A **MUST** in any shop—complete with instructions on proper use $6.00
(subject to regular gunsmith discount)

WILTON PRECISION-BUILT VISE:

- UNSURPASSED PRECISION.
- PRACTICALLY INDESTRUCTIBLE.
- NO SIDE TWIST OR WOBBLING.
- NO DEAD MOTION.
- HORIZONTALLY ANCHORED
- JAWS REVERSIBLE
- BODY ENTIRELY CLOSED
- ANVIL AND TOP OF JAWS ARE SURFACE GROUND AND PRECISELY PARALLEL.

Five Year Guarantee

Sizes and Prices

2" jaws. #20S (5 lb. shipping weight) ...	11.20
2½" jaws. #25S (13 lb. shipping weight)	14.05
3" jaws. #30S (23 lbs.)	14.95

(Other sizes available...write for prices)

MORSE GUNSMITH TAPS, DIES

No. 6x48 taps, per half dozen $2.00
No. 6x48 dies, ⅝" button 1.00
No. 8x40 dies, ⅝" button ... 1.00
No. 8x40 taps, per half dozen.. 2.50

Complete machine screw tap and die sets from $8.50 to $23.50—full assortments American threads from No. 0 to No. 14 gauge. Wilton Tap Extractors (save the cussing).

Broken taps up to No. 10 at....................$1.50
No. 10 up to 9-32" at 1.55
(You want the above for No. 8 & No. 6)

Set of SIX Barren Router Bits 9.50
(These are Hi-Speed, ideal for stock work.)

Hi-Speed End Mills
Cleveland double end, 4 lip ¼" & ⅛" at......$2.75
¼" Mo-Max HS Lathe tool bits, ea.............. .26
per dozen 2.90

E-Z cuts for busted drills.
Get yourself a set of four 2.00

6½" Knurled needle files
Three square, ea. ....35 Per dozen.. 3.50
Three square bent, ea. ....40 Per dozen.. 4.00

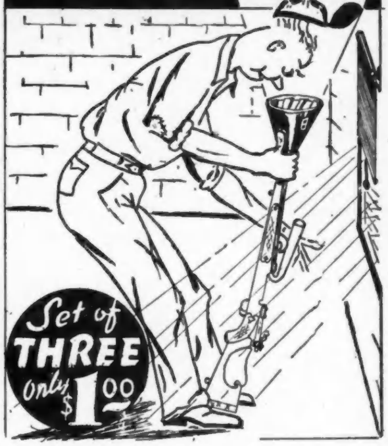
"V" blocks
Best precision, set of two, one clamp 3.45

Miscellaneous
Schmidt barrel rasps, complete 3.50

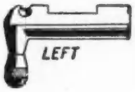
Gunsmith's Pyralin Tipped Mallets with screw in, changeable tips.
¾" mallet, 4 oz. 1.05
1" mallet, 6 oz. 1.47
1¼" mallet, 11 oz. 2.00

Power Buffing Machines. 36" between centers, pedestal.
1 HP 3 phase. Immediate Delivery $150.00

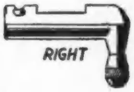
BORE-LITE



Bring the outside right into your gun with these sets of Lucite rods . . . really do a job of lighting up. Sizes for shotguns, rifle and .22s.



NEW CROWE ROTARY SAFETY



For Model 12's

Fits all model 12 Winchesters—12, 16, 20 and 28 gauge. Installed in less than a minute. You'll like your gun much better. Specify right or left hand. $2.00 postpaid.

Attractive gunsmith discounts on stock orders

Free!!

Send for this complete and thorough booklet on bluing and polishing. A complete and thorough analysis of the entire process from start to finish—used and followed by thousands of gunsmiths.

SALT PRICES

10 lbs.	$ 4.00
20 lbs	6.00
50 lbs.	14.00
100 lbs.	24.00

(10 lbs makes 1½ gallons solution)

BROWNELL'S

HOW TO BLUE

INSTRUCTIONS

FOR BLUING STEEL PARTS GUNS

Polish-O-Ray

The new and extremely necessary addition to your polishing needs. Greaseless; not a hard glue but a soft **FAST** cutting abrasive to be applied while the wheel is running. For felt and muslin wheels. In grits No. 140, 240, and 400. Two Pound Tubes $1.00; 555 for the Master Quality finish in 3 lb. cakes $1.50. Now used by most gunsmiths and home hobbyists over the continent.

TERMS

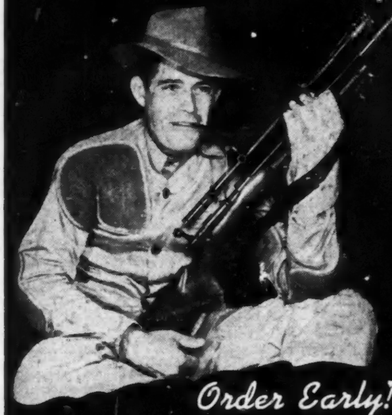
All orders F.O.B. Montezuma, Iowa
For Parcel Post Include Postage
C.O.D. Orders Accepted from N.R.A. Members

Complete GUNSMITH'S MART CATALOG and BUYING GUIDE. Over 150 pages. Thousands of wanted items. Everything you need from one dependable source. Lowest prices. Fast service. Send $1.00 for your copy. Price refunded with your first $10.00 purchase.

THE GUNSMITH'S MART
BROWNELL INDUSTRIES, INC.
MONTEZUMA, IOWA

For Christmas GIVE A 10-X RIFLEMAN'S COAT

Designed by Riflemen for Riflemen!



Give This Lasting Gift

a 10-X Imperial Rifleman's Coat

- ★ Finest materials, finest workmanship. Designed for rifle shooting as only a rifleman could design a shooting coat.
- ★ Patented features found only in 10-X riflemen's coats.
- ★ Available with leather covered pads or with NO-SLIP rubber covered pads.
- ★ This is IT—the rifleman's coat every rifle shooter must have.

SATISFACTION GUARANTEED

FOR ONLY **$13.00** POSTPAID

Order Early!

BE SURE OF DELIVERY FOR CHRISTMAS

See your dealer first— If he can't supply you with a 10-X rifleman's coat and glove, send your order direct to the factory. Exchanges of misfits will be made promptly without charge after Christmas.

10-X Rifleman's Glove

Rifleman Designed. Properly padded. A necessity to good rifle shooting. Your rifleman must have one for Christmas.

ONLY **$3.50** POSTPAID

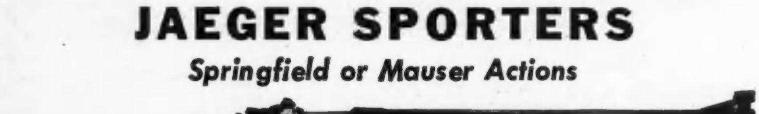
10-X MANUFACTURING COMPANY

307 ELEVENTH STREET • DES MOINES 5, IOWA

★ ★

JAEGER SPORTERS

Springfield or Mauser Actions



REBARRELING

30/06—300 Sav.—270—257—250/3000—220 Swift

JAEGER QUICK DETACHABLE SIDE MOUNTS **JAEGER SAFETIES**

We carry a large selection of popular scopes, mounts and sights

PAUL JAEGER

Jenkintown *CATALOG ON REQUEST* Pennsylvania

★ ★

• **BEDFORD BUGLE** •

SHOWS WORLD'S RAREST GUNS

No. 9—Finest pistols, swords, all nations.
No. 10—All kinds. Shooting Muzzle Guns, Experimental, Foreign, Royal, Superb Inlays, Martials, World's Finest and Rarest.
Free; send self-addressed stamped LONG envelope with number marked.
WANT: Finest American and Foreign, Modern or Muzzle Loading, Foreign Doubles, Mausers, RAREST COLTS. Describe and Price.

MILLER BEDFORD

Rare Gun Crossroads of America

NEW LONDON OHIO

SIGHTS

RETAIL AND WHOLESALE

We believe that we have the largest and most complete stock of ALL MAKES of new and used sights & scopes in the U. S. Used sights in excellent or better condition taken in trade. Expert sight mounting and targeting. Fast and accurate service.

Dealers inquiries invited.

WRITE US REGARDING YOUR SIGHT PROBLEMS

THE ORIGINAL SIGHT-EXCHANGE

"Gun Sight Specialists"

P. O. Box J Paoli, Penna.

Al Biesen, La Crosse Gun Shop, 1932 Loomis St., La Crosse, Wisconsin, has been recommended quite highly by several reliable persons as a very fine stockmaker. Some of his work has been compared with that turned out by Bob Owen, Griffin & Howe, and the late Alvin Linden. He specializes in stocks for fine hunting rifles, but does all other types of stock work. Photographs of some of his stock jobs verify the favorable recommendations by satisfied customers.

☆ ☆ ☆

Optical Coating Laboratory has just moved into a new and much enlarged shop on Route 1, Clinton, Md., from their old address at 5807 M Street, Hillside, Washington 19, D. C. They are now equipped for the coating, cleaning, and repairing of all optical instruments, including those of foreign make. This was one of the first organizations to offer coating services to NRA members.

* * *

Cole Agee, the custom gun engraver, of Trinidad, Colorado, has notified us that he is leaving on an extended trip and will not be doing any more engraving until further notice.

BOOK REVIEWS

BIG GAME HUNTING

By Major Ned H. Roberts

The man who developed the popular .257 Roberts cartridge, has called upon his many years of outdoor life in writing a comprehensive text which should interest all hunters of deer and black bear. The book is small, almost pocket size, but each of its subjects is handled generously.

Food habits, behavior pattern, and distribution of deer serve as introduction to this most sought after big game animal in the United States. A buck's weaknesses and strong points are carefully emphasized so as to permit the most efficient use of the rather limited woodcraft possessed by most city dwellers.

A deer hunter will usually take his buck by means of the drive or through "still hunting." He will find here a study of each manner of hunting with the author's recommendations and preferences clearly stated. Considerable attention is also devoted to the selection of rifles, cartridge, sights, scope mounts, knife, clothing, and other essentials.

A chapter on "where to aim," which stresses the importance of a few anatomy fundamentals, is made clear with line drawings and detailed explanations. Robert's system of caring for a buck once it is down, provides for efficient and safe handling from death-site to table. A close study of the method should save valuable meat, a useful hide, and an attractive trophy for tyro hunters fortunate enough to benefit by the author's experience.

Hunters of black bear will be particularly interested in the second half of the book which is devoted to the taking of bruin and its slightly different problems.—J. S. R.

(Published by Paul Richmond & Co., Chicago, Ill. Available through the NRA Book Service; 160 pages, $1.50.)

THE ARMS CHEST

GENERAL REQUIREMENTS APPLICABLE TO CLASSIFIED ADVERTISING

1. Rate: 20 cents per word including name and address—minimum charge $3.00. All advertisements must be accompanied by remittance, made payable to "National Rifle Association"—1600 Rhode Island Ave., Washington 6, D. C.

2. Closing Date: All advertisements must be received by not later than the 1st of the month preceding date of issue. (Example: the 1st of December for the January issue. Ads *received* after the 1st of December *and not later than the 1st of January* will be inserted in the February issue.)

3. Who May Advertise: Any individual or firm whose advertisements and methods of doing business meet our requirements may advertise their goods or services in the ARMS CHEST.

4. All Orders Subject to These Conditions: WE reserve the right to edit all copy to conform with our standards and to reject or discontinue any advertisement which we consider undesirable.

5. Transactions Based on Good Faith: ARMS CHEST transactions are based on good faith and mutual satisfaction. Deliberate misrepresentation, disregard of usual business ethics or the attempt to circumvent these general requirements, when brought to our attention, will result in refusal of further advertising and might result in disbarment from the NRA in the case of members.

6. Blind Ads Not Acceptable: Box number or blind ads will not be accepted. Give your COMPLETE name and address, to insure prompt delivery of all mail or telegraph replies.

7. How to Count Numerals, Etc.: Groups of figures are counted as one word (example: .30-30, 250-3000, $150.00, $1.50). Abbreviations consisting of initials or single characters likewise are counted as one word (example: W. H. Smith; H. B., meaning heavy barrel; HP., meaning high-power). Hyphenated words are counted as two words (example: 20-gauge, pearl-handled no-slip).

8. Responsibility for Illegible Copy: Type or print advertisements plainly, as we can not be responsible for errors due to illegible writing.

9. Firearms for Sale or Trade Must Be Properly Described: The *condition* of every gun (including essential parts) advertised for sale or trade, *must* be specified according to *NRA standards,* as follows: PERFECT—meaning factory condition; EXCELLENT—meaning new condition, implying negligible amount of use; VERY GOOD—meaning practically new condition; implying little use, with no appreciable bore wear and only minor surface scratches or wear; GOOD—meaning moderate use with some finish worn off, only moderate bore wear, with no pits and nothing worse than a little roughness in the bore; FAIR—meaning no parts missing necessary to use of gun, reasonable wear inside and out, nothing worse than minor pits in steel or stock, gun sufficiently accurate for hunting. POOR—meaning marred appearance and pitted or badly worn bore.

10. Definite Prices Must Be Stated: A specific price must be stated on all items offered in FOR SALE and SELL or TRADE ads—except that the phrase "write for catalog" or "write for price list" may be used when listing merchandise in quantities.

11. Non-Specific Phrases Barred: Phrases such as "highest" or "top prices paid," as well as any other so-called "auction-type" phrases are not acceptable. The terms "fair price paid" or "state price wanted" may be used.

12. Requesting Privilege of Examination: We *insist* that purchasers desirous of examining merchandise before acceptance request shipment by express C. O. D. with examination privilege. This procedure permits the purchaser to inspect the merchandise *in local express office* and authorizes the express company to return unsatisfactory merchandise at shipper's expense.

13. "Outlawed" Firearms Cannot Be Sold: Federal statutes forbid the sale or trade of all machine or submachine guns; sawed-off rifles and shotguns with barrels of less than 18" (the exact barrel length must be specified for all Mannlicher-Schoenauers) and Mauser and Luger auto pistols *with holster stocks*—except by a Federally licensed dealer who has paid the special tax required by Section 3260, Internal Revenue Code.

In addition the N. R. A. has adopted a policy of not accepting advertisements covering small semi-automatic pocket pistols which have no practical value as target, police or military weapons.

FOR SALE

LARGE COLLECTION OF AMERICAN AND European antique arms. Send 25¢ in coin for our 15th edition catalog featuring the Brown collection of Kentucky rifles. We buy whole collections or single pieces. Fair prices paid. Kimball Arms Company, Woburn, Mass. tf

HARD-TO-FIND PARTS AND ACCESSORIES for caplock arms, 45-70 Springfields, etc. New list #23 mailed on receipt large addressed envelope. Don't miss our exclusive Lyman double mould casting, .36/.44 Conical Colt balls. James Serven, Santa Ana, Calif. tf

CATALOG OF ANTIQUE PISTOLS, REvolvers, guns, rifles, edged weapons, armor, accessories, books and antiques, listing over 1200 items with 60 photo plates, illustrating over 850 items for sale in the catalog. Price $1.00. H. A. Brand, 704-G Ingalls Bldg., Cincinnati 2, Ohio. 8-48

MUZZLE GUN SUPPLIES: NIPPLES FOR shotguns, rifles, revolvers and muskets, 25¢ each or 5 for $1.00—all in tool steel. Rifle and shotgun usually take the .250 base with 28 threads; revolvers .225 base—32 threads; muskets .317 base, 24 threads. Also carry .260-28 and .285-28—same price. Flints for pistols or rifles, $1.25 per dozen. Percussion caps—#10 for pistol and #11 for rifle and shotguns—$3.40 per 1000; musket caps $4.40 per 1000—may come by express. Fresh Dupont Black Powder—6¼ pound can $4.00, 25 pound can $12.50, FOB. Freight only. Hickory ramrods, .38, .40, and .42 $1.00 each; large sizes $1.25 each. Nipple wrenches for rifle, pistol and musket (specify which) 75¢ each. Moulds, round balls, .285 to .50—$6.00 each; above .50—$6.50 each. See Lyman list for sizes; top quality and very accurate. Drum, nipple and clean-out screw combination—send old drum for checking measurements 75¢. Powder measure with graduations for black powder, zero to 100 grains, plastic, $3.25. Lyman 17-A front sights $3.00; early Sharps front with base .460" wide and German-silver blade 75¢—nice stock. Redfield M70 peep rear for Mauser conversions $8.50. Buhmiller .22 barrels, not turned outside or threaded $17.50. Curly Maple stocks 5 feet by 2¼", seasoned one year, $9.00. Walnut planks 7 feet by 8" by 2¼" $15.00 FOB—cured about 13 months. A few good squirrel and match rifles—tell us your wants. Farris & Son, Portsmouth, Ohio. tf

EVERYTHING IN PERCUSSION GUNS, some in flint from $3.50—too many to list—Give us your wants. Farmers & Traders Exchange, Chittenango, N. Y. 1-48

WRITE FOR FREE LIST OF NEW HANDguns and pistol shooting accessories. Star Sporting Goods Co., 83 Third Street, San Francisco 3, California, Dept. NP-1. 12-47

THE FINEST RECOIL PAD MADE ANYwhere, White Line pads $3.00. American Gun Works, 1284 Sunset, Los Angeles, California. tf

8x57 CARTRIDGES SPORTING LOADS 160-170-190 gr. bullets, $15.00 per hundred. 8mm primed cases $7.00 per hundred. New Weaver scopes. K2.5 $34.00. K4 $38.00. Remodeled Mausers, Springfields, Enfields & Krags. Write for prices on equipment you need. Trades accepted. T. G. Crain, 919 Millville Road, Altoona, Penna. tf.

HI-STANDARD H. E. THUMB-REST GRIPS, trigger-shoe, holster, near excellent $55.00. C. S. Lefever, 755 West Vine St., Lancaster, Penna.

ALWAYS A GOOD STOCK OF COLLECTORS arms and visitors always welcome. House of guns, 34 Alpine Place, Kearny, N. J. tf

SKIS—7' LAMINATED HICKORY WITH steel edges, cable bindings, laminated bamboo ski poles—all brand new Gov't complete set $19.75. New Gov't ski boots $7.95. Jim Craton's, Davenport, Iowa. 1-48

.45-70-500 SMOKELESS CARTRIDGES. $1.74 per box, $8.00 per 100. Headless shell extractor for the Springfield rifle & carbine, 75¢. Rubber slipon recoil pads, for rifle or shotgun, 90¢. Dept. R. Bolin's Gun Shop, 9 Grand St., South Amboy, N. J. tf

SHOOT WITH A MUZZLE CAP ON YOUR rifle, shotgun, pistol and play safe. Positively keeps bore of firearm free of dirt, moisture, snow, dangerous obstructions under all firing conditions, range or afield. Simple to use. No effect accuracy, breech pressure. Made of Neoprene. This sensational gadget, endorsed everywhere, makes ideal scope cover also. Shooters! Get your seasons supply by return mail, 35¢ dozen, or 3 dozen for $1.00 postpaid. State whether for rifle, pistol, shotgun, scope. Woodford Mfg. Co., Lyndhurst, Ohio. tf

INVENTORS: WRITE FOR FREE BOOKLET explaining how you may secure greatest profit from your hunting, fishing or other sports inventions, patented or unpatented. Institute of American Inventors, Dept. 131—1926 Eye St., N.W., Washington 6, D. C. tf

SHOOTERS—ON THE RANGE, KEEP YOUR targets neat and tidy; patch the holes with Kurve-Kut target pasters; packed 500 pasters to the roll in handy dispenser-type cardboard box-black, white or buff; 30 cents per box at your dealers or send your order to Razorback Target Pasters, Route #2, Fayetteville, Arkansas. tf

ELECTRIC PENCIL: WRITES, ENGRAVES all metals. $1.00 postpaid. Beyer Mfg., 229-Z Dixson Blvd., Uniontown, Penna. 12-47

MUZZLELOADING GUNS, POWDER. Flasks. Price list 10¢. Ollie Miller, 417 Kingston, Lemay, Missouri. 12-47

USE THE NEW GAS PROOF GUN WAD FOR mild recoil, close even pattern, unusually long range, $4.00 per M. Packed in 1000 lots, 500-⅜", 250-⅛C, 250 thin C, send remittance. E. G. Snyder, Rt. #2, Reading, Penna. tf

SERVICEABLE SA COLT PARTS: HAMmer $2.75; trigger $1.25; gate $1.50; ejector head $1.50; trigger guard $2.75; screws 30¢ each. 20 shot magazine for 30-06 Springfield $6.25; .22 (short) supplemental chamber M1903 Springfield $1.25. C&B revolver repair parts, moulds, accessories. B. K. Wingate, Box 481, Reading, Penna. 1-48

ANTIQUE ARMS. SEVERAL HUNDRED U. S. pistols and long guns. Military and sporting. No modern. Price list 25¢. Wm. M. Locke, 3607 Ault Park Road, Cincinnati, Ohio. 12-47

LOADING TOOLS, BULLETS, POWDERS. Price list. G. D. Hoover, 2227 Inyo Street, Fresno, California. 12-47

PAY YOURSELF A CASH BONUS!

By selling some of your idle or surplus shooting equipment you can pay yourself a sizable first-of-the-year bonus, in cash.

And a little extra money probably will come in mighty handy right about now to help pay those special Christmas bills!

So make up an ad, giving *complete* description of the various items you would like to sell, and send it to the "Arms Chest" pronto.

* * *

Final closing date for the February 1948* issue is January 1st.

**Guaranteed circulation in excess of 260,000!*

GUN BOOKS
Of Lasting Merit

DEANE'S MANUAL OF FIREARMS

First published in London 1858 and now offered for the first time in facsimile. 286 pages of information on firearms history and progress. This manual will fill a space in your gun book library that might otherwise remain forever vacant. A book you will never consider reselling. — $6.00

A TREATISE ON THE RIFLE, MUSKET, PISTOL AND FOWLING-PIECE

by N. Bosworth

A faithful facsimile of one of the most sought-for publications in firearms literature. Written by an American arms authority in 1846, it is even of greater value today. In these pages you will find gun information of a century ago that you would not part with for many times the book's price. — $4.00

SMITH & WESSON HANDGUNS

by McHenry - Roper

A fresh, well-written volume, without commercial bias. Here is the first and only complete story of S & W handguns and their makers. Plate pages show 62 scale-photographs of S & W guns. A book of first importance to shooters and students of arms. — $7.50

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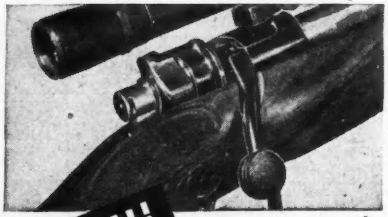

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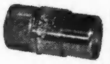

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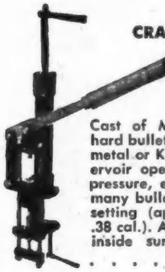

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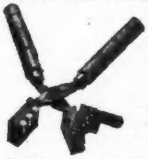

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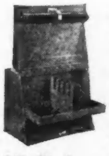

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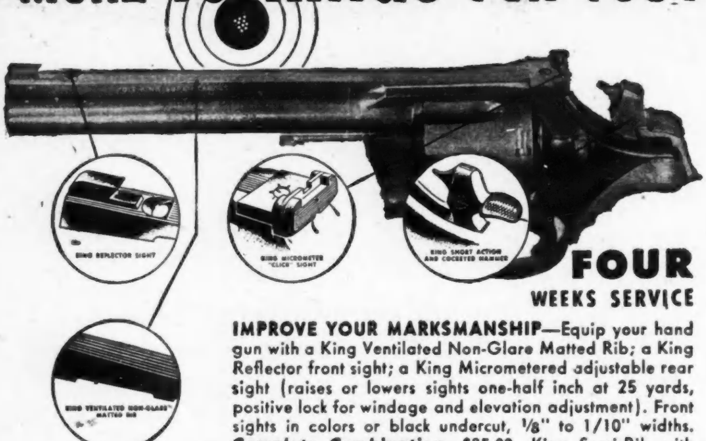
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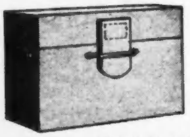

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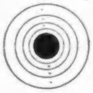

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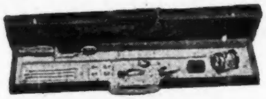

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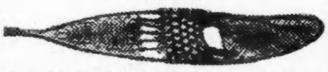

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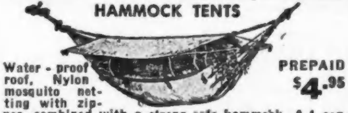

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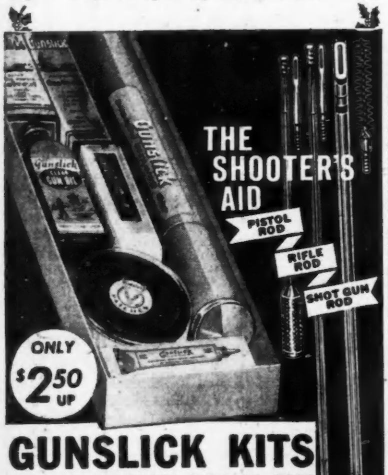

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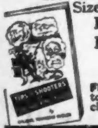

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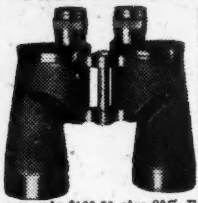

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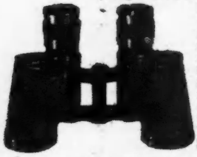

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Both Universal Tool models, A and B, are identical in all parts except for differences in the turret heads. Model A, illustrated at left, holds three dies in its indexed rotating head, sufficient to reload any single caliber cartridge. Model B, illustrated at right, fills the need of the shooter who owns guns of several calibers and wishes to keep his dies set-up and handy for immediate use.

Shown above, Model A tool Retail price

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Prompt deliveries are assured on either Model A or Model B Tools and on Dies for the following calibers:

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22 Wilson Arrow
.218 Bee
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.219 Zipper
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22 Savage H.P.
.220 Swift
22-250 Varminter
22 Gebby Baby Var.
22 Gebby Jr. Var.
22 Gebby Sr. Var.
.240 Gebby Super Var.
.240 Gebby Super Bltd.
.25-20
.250-3000 Savage
25 Remington
.25-35
.256 Jap
.257 Roberts
6.5 mm.
.270 Winchester
7 mm.
.280 Ross
7 x 64 mm.
7 x 57 rim mm.
30-30 Winchester
30 M1Carb
30 Rem.
.300 Savage
.300 H.& H.Mag.
30-40 Krag
30-06
.303 British
32-20
32 Win. Spl.
32-40
8 mm.
8x57 rim mm.
9.3 x 62 mm.
.348 Win.
35 Rem.
.351 Win.
.375 Magnum
38-40
38-55
.401 Win.
.405
44-40
45-70
45-90
.256 Newton
30 Newton
35 Newton
.218 Bee CCC.
.219 Zipper CCC.
22 Swift CCC.
22 H.P. CCC.
22 Varminter CCC.
22-06 CCC.
22 Magnum CCC.
.250-3000 Sav. CCC.
.257 Roberts CCC.
25 Krag CCC.
25-06 CCC.
25 Magnum CCC.
.270 CCC.
.270 Magnum CCC.
7 mm.-06 CCC.
7 mm. Magnum CCC.
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7x65 Luger
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38-40
44 S&W Spl.
44-40
45 ACP
45 Auto rim
45 Colt rev.

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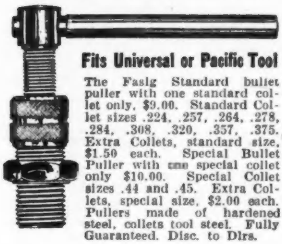

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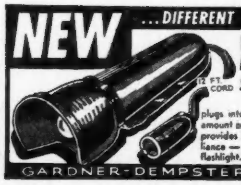

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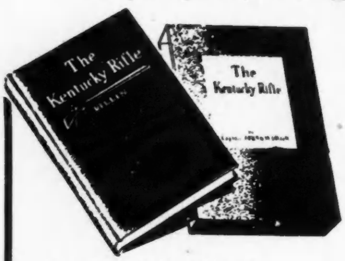

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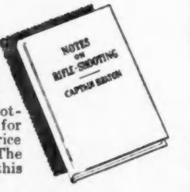

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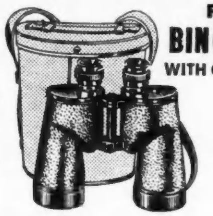

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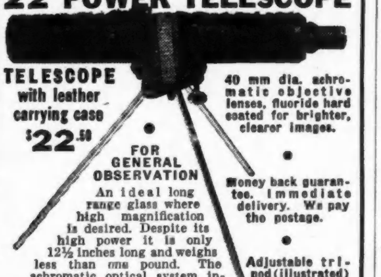

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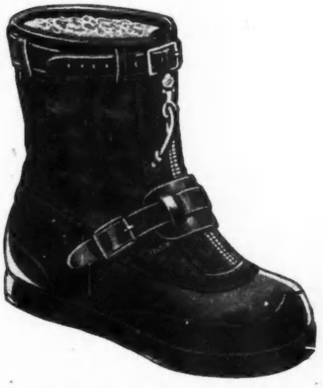

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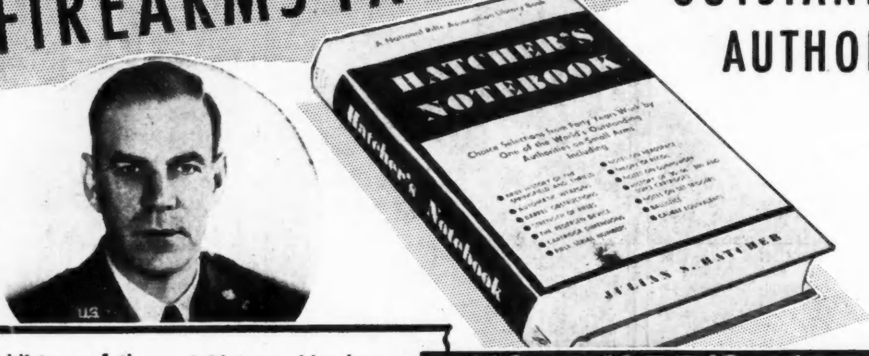

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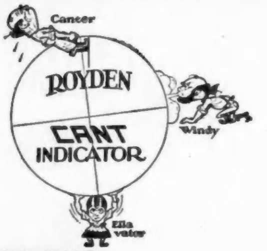

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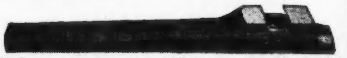

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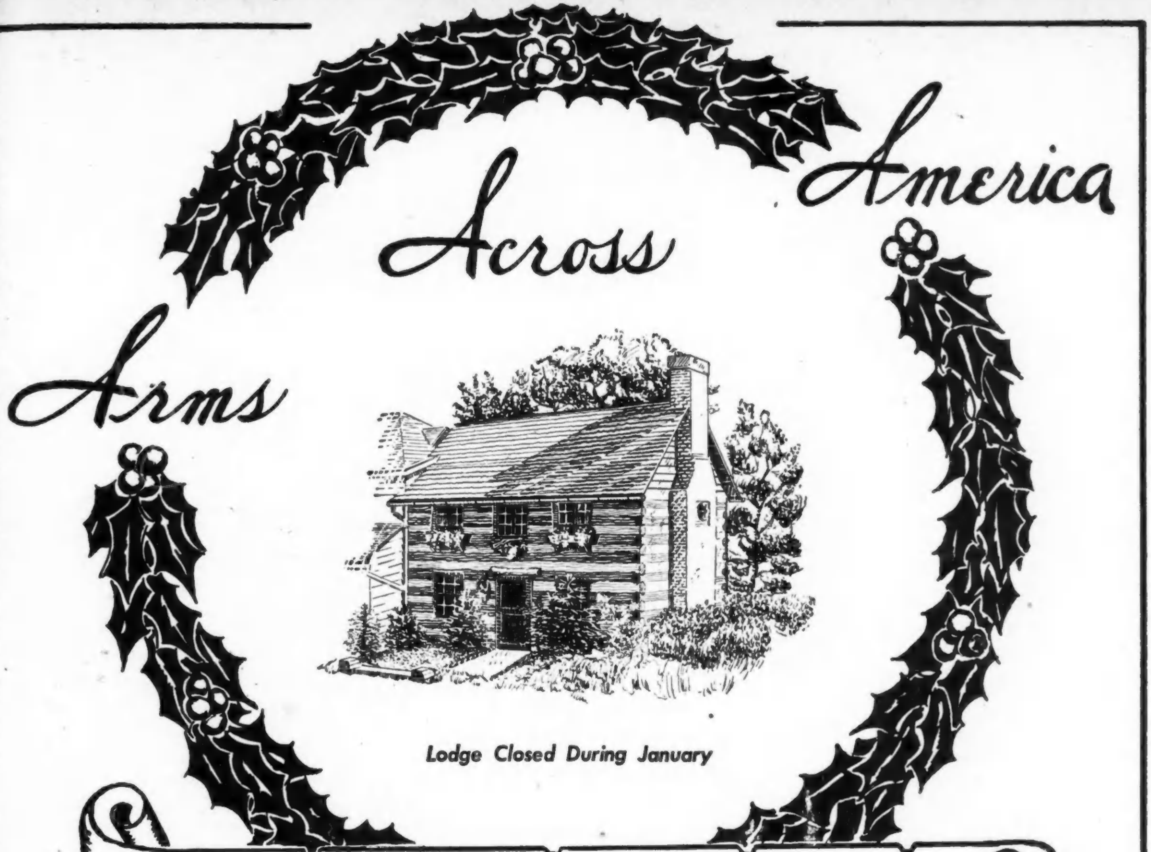

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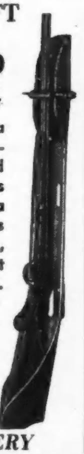

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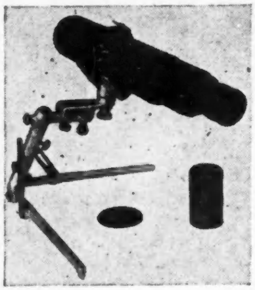

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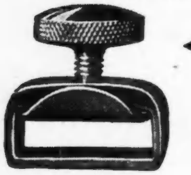

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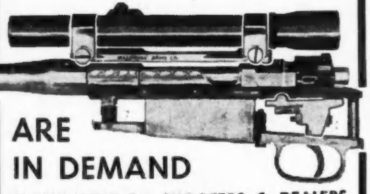

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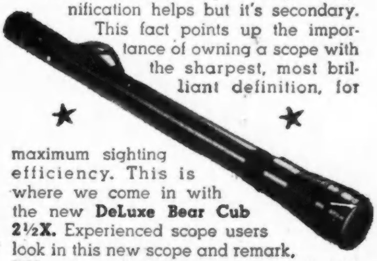

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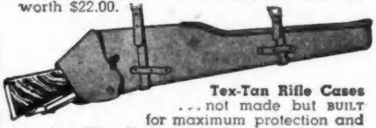

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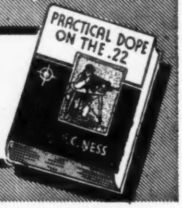

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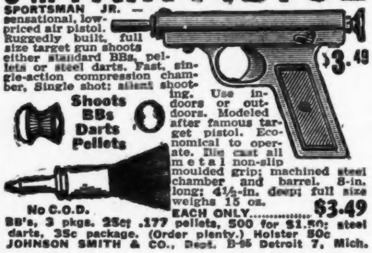

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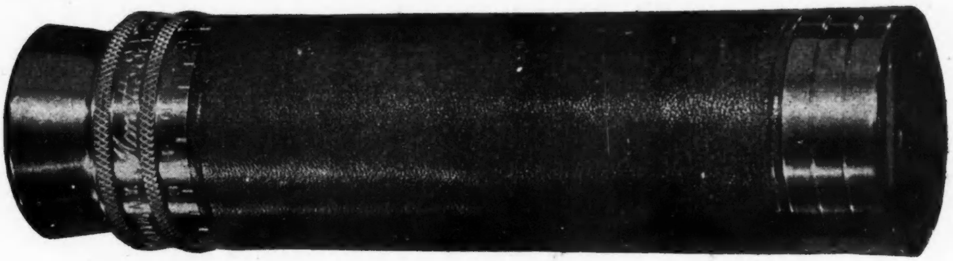

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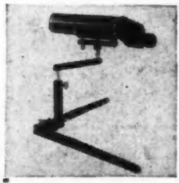

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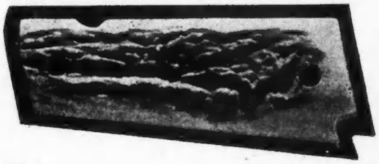

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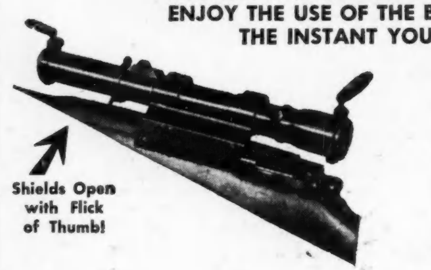
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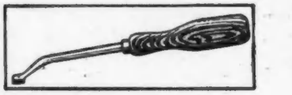

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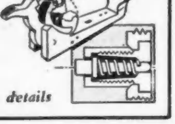

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BARGAINS FOR RELOADERS: PACIFIC tools cals. 250-3000; 22-250; .270; 8mm. 30-06; .220 Swift; .257 Roberts; .38 Special; .38 Super auto.; .45 auto.; 9mm. Luger. Standard, $26.00; Super, $33.50. Dies, shell-holders, priming arms, Speer and Sisk bullets in stock. Pacific powder scales, $7.95 complete. Fresh Dupont and Hercules powders, $1.75 lb. (5 lbs. or more, $1.60 lb.). NMNC primers, all sizes, $5.75 per 1000 (5000 or more, $5.50 per 1000). Commercial Colt .45 automatics, $55.00. Remington 513TR .22 Target rifle, Redfield sights, $49.00. Winchester M97, 12 ga. 28" modified, $59.00. Remington 521T .22 Target rifle, Lyman sights, $33.95. S&W .38 Special M&P, 4", $49.00. Hi-Standard HDM .22 automatics, $47.00. All above guns brand new, latest models. New Weaver scopes: K2.5, $35.00; K4, $40.00; J2.5, $19.95; G4, $8.95. Excellent Savage 23D Hornet, sling, G4 scope, 4 boxes ammo., $89.00. Shotgun and metallic ammunition at less than list. Stamp appreciated. Joe Ivy, 910 Burlington, Dallas, Texas.

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3 BARRELED GUN BY KRIGHOFF, 16 gauge double over 9.3x92 rifle, good, $250.00. Tell Free rifle 7.6x48, perfect except no rear sight, $175.00. DWM Luger 9mm., 8" barrel, excellent, $75.00. Winchester .33, excellent, $100.00. Remington-Lee 38-55, no barrel sight but slot for same Lyman sight on cocking piece, very good, $50.00. John C. Bristow, 7622 Sweetbriar Road, Richmond, Virginia.

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5E ITHACA 32" MOD. & FULL, SINGLE selective trigger, excellent in and out, automatic ejectors, ventilated rib Beavertail, $315.00. Browning overunder 26" imp. cyl. and mod., ventilated S.S.T. latest one made, excellent in, some bluing wear on bottom of breech, $200.00. L. C. Smith Single trap, 32". Specialty, very good, v. rib., $145.00. W. Sonnenschein, Pipestone, Minnesota.

P.38 V.G. OR BETTER, $40.00. LUGER 9mm., good, $45.00. Prepaid in Alaska. Additional details on request. D. O. Murray, Box 184, Ketchikan, Alaska.

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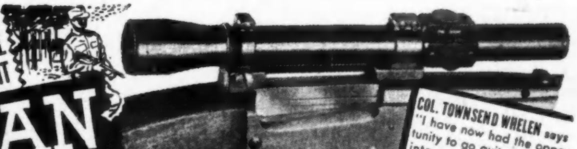

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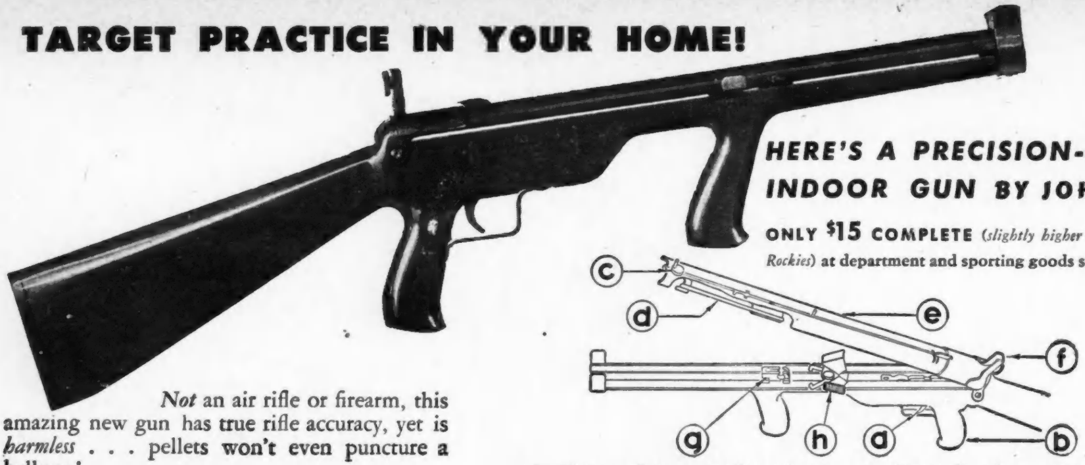

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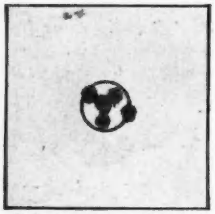

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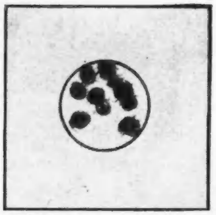

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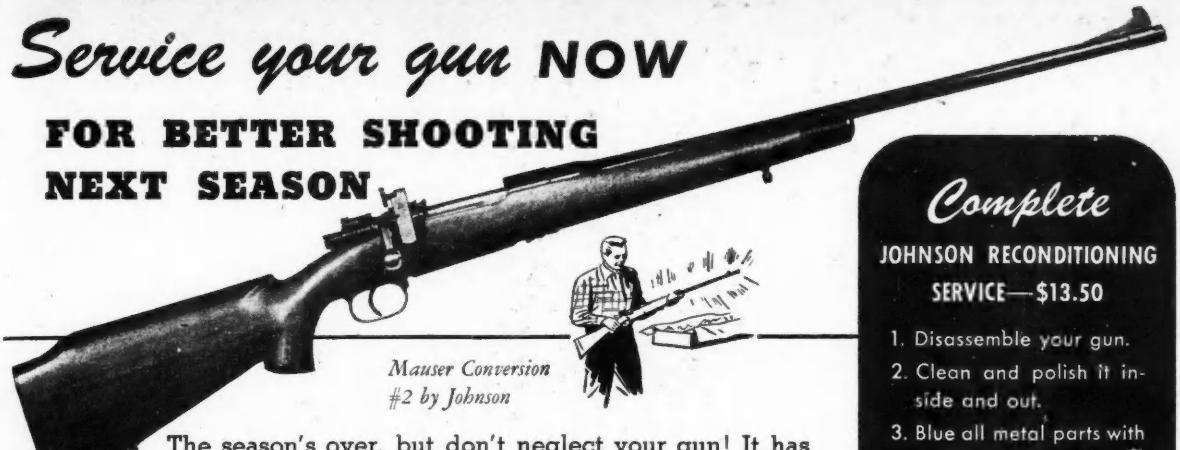

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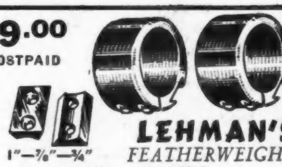

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Barrels, Remington Model 10 repeater, 20" Cylinder, with fitted receiver extension, 12 gauge, new	10.00
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SHOTGUN SHELL PRIMERS AT LESS THAN HALF PRICE! WESTERN No. 209 BATTERY CUP fit all Western, Winchester, and Federal shells per thousand, $5.25; per case of 5,000	18.00

(These primers now list for $10.50 per thousand. Special prices in hundred-thousand and million lots)

New Empty Primed Shells, Western Super-X, 250-3000, $7.50 per hundred; $36.25 per 500; $69.30 per M.	
Bullets only, 6.5 Mannlicher-Schoenauer, Remington 150 grain Soft Point, $6.75 per 100; 44-40, 160 gr. H.P.	3.50
Unertl 1"—10X, complete with latest mounts, coated lenses, used but perfect inside and out	50.00

SIGHTS & MOUNTS

Redfield Junior, for most rifles $10.75, $12.75	$14.75
Stith, for all scopes, 70 or 99, 15.00.Q.E.D.70 only	17.50
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Lyman 77 and 77H, with base and inserts	5.00

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S&W, M&P, 2" & 4", Magna Grips, 38 Spl.	56.50
H&R Sportsman, to dealers only, 3 for	104.85

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The TEXAN, Post or Crosshair	50.00
Weaver (post or crosshair), K2.5, $37.50; K4,	45.00
Argus Spotting Scopes, Super Grade 20X, 55mm.	74.50
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B&L 6x30, Lightweight, $134.40; 8x30, Zephyr	180.00
(All above items latest type with coated lenses)	
Weaver J2.5 Xhair, $22.50. 440S post only	27.50
B&L RAYBANS, Ladies & Regular, $10.75. Skeet	12.50
LARGE RAYBAN SHOOTING GLASSES	15.00

The above listed items constitute my entire stock at present. As it's hunting season now please do not write about any items not listed.

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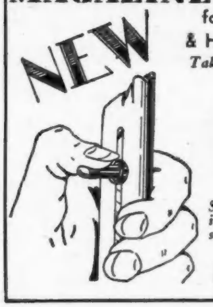

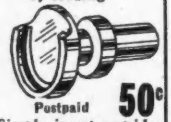

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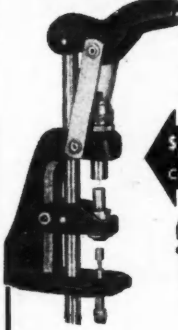

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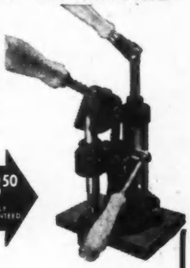

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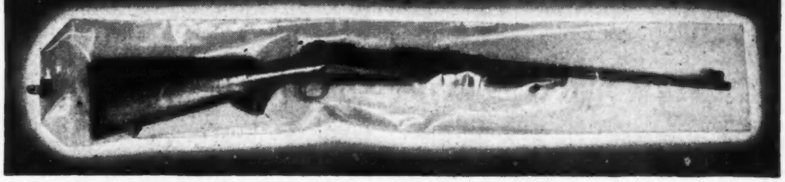

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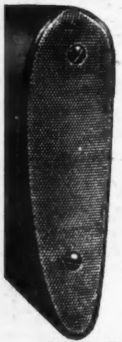

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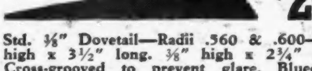

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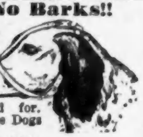

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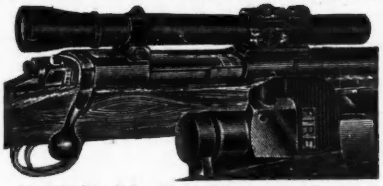

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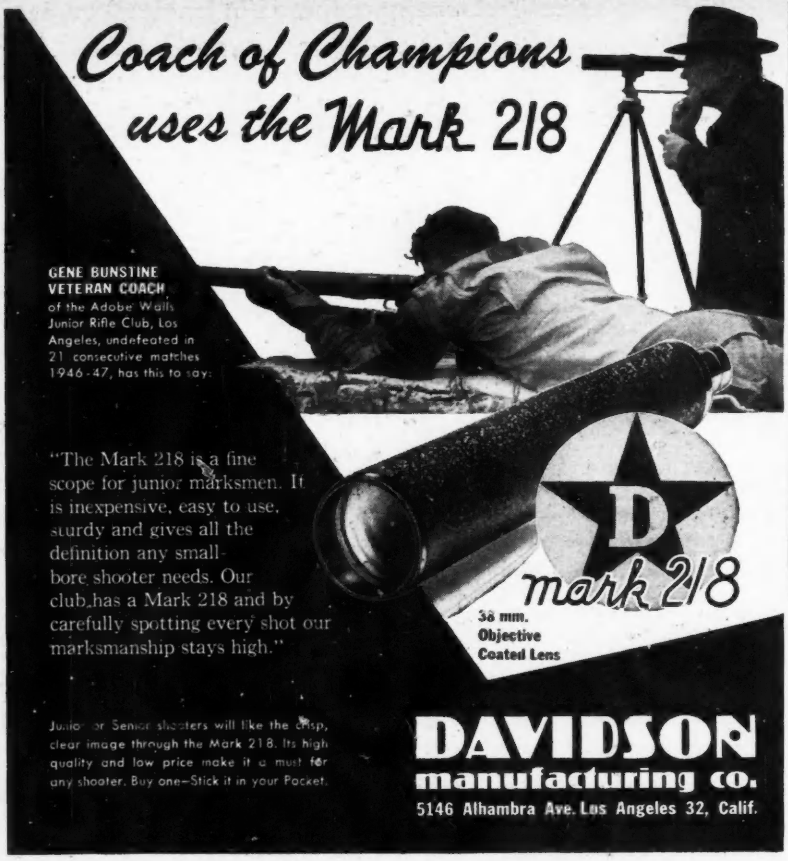

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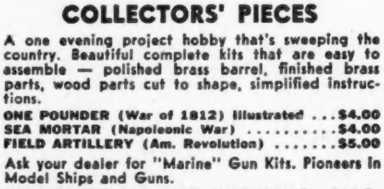

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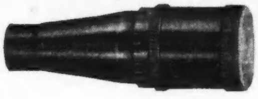

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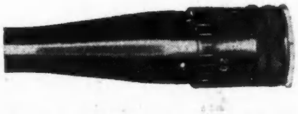

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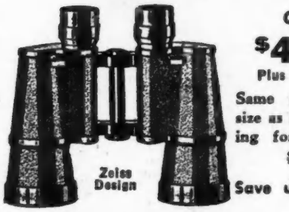

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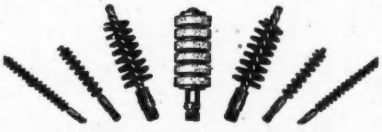

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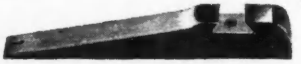

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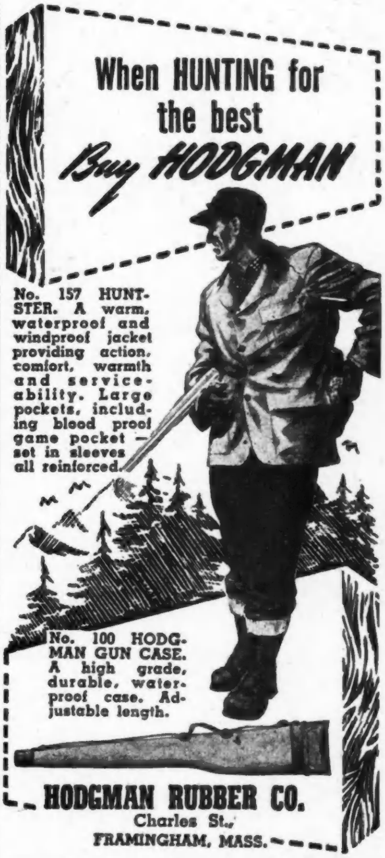
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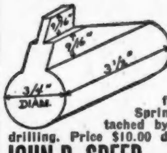

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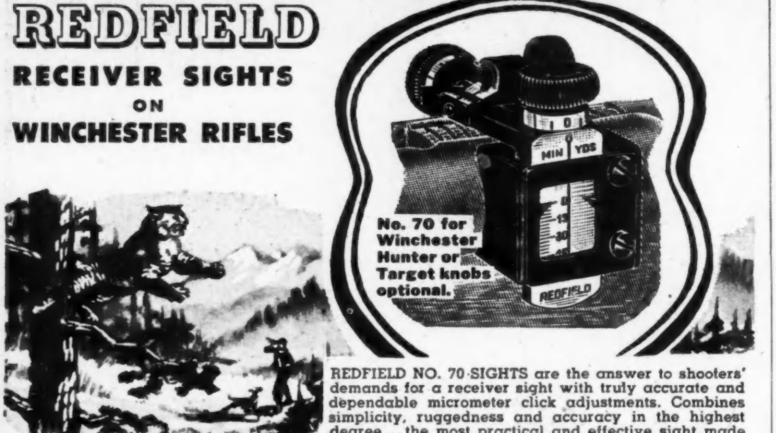

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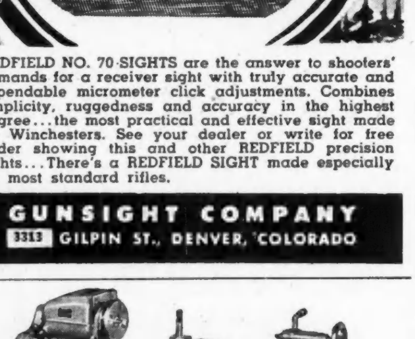

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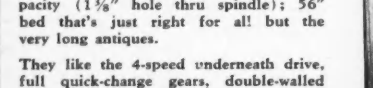

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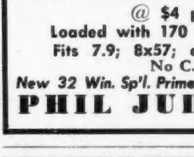

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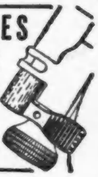

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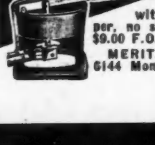

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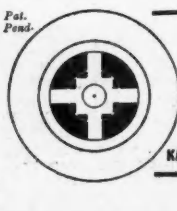

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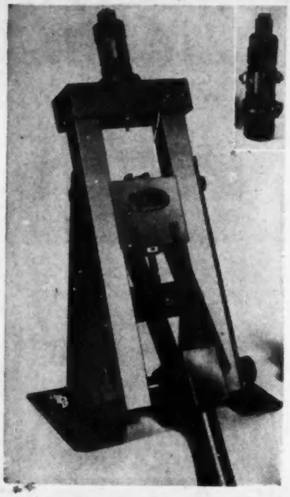

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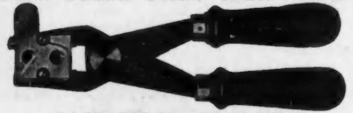

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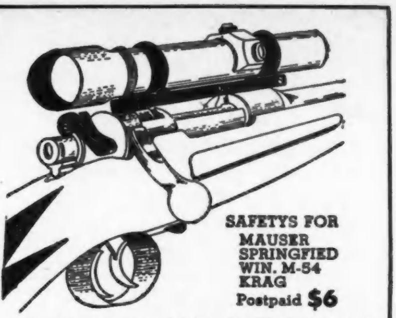

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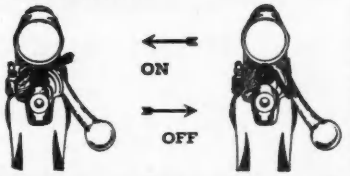

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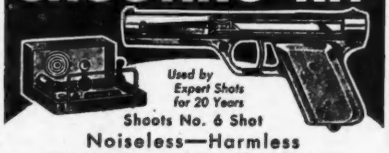

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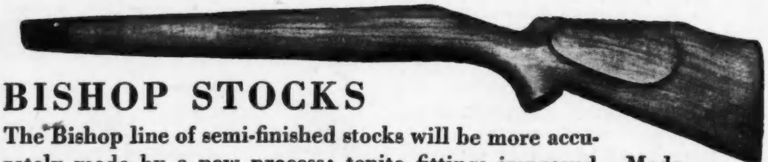

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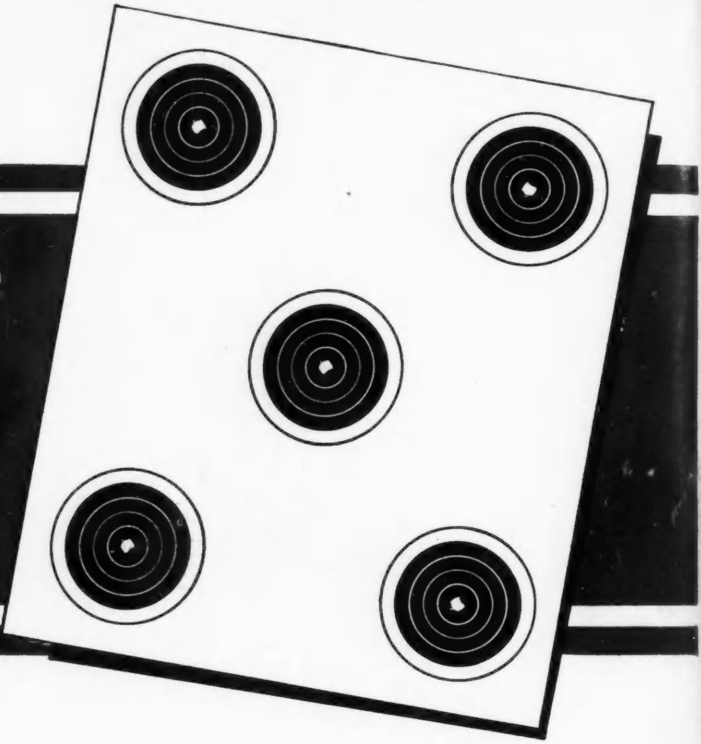

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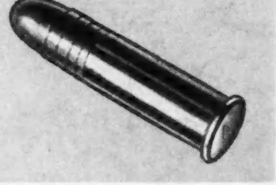

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